

MANUFACTURERS RECORD

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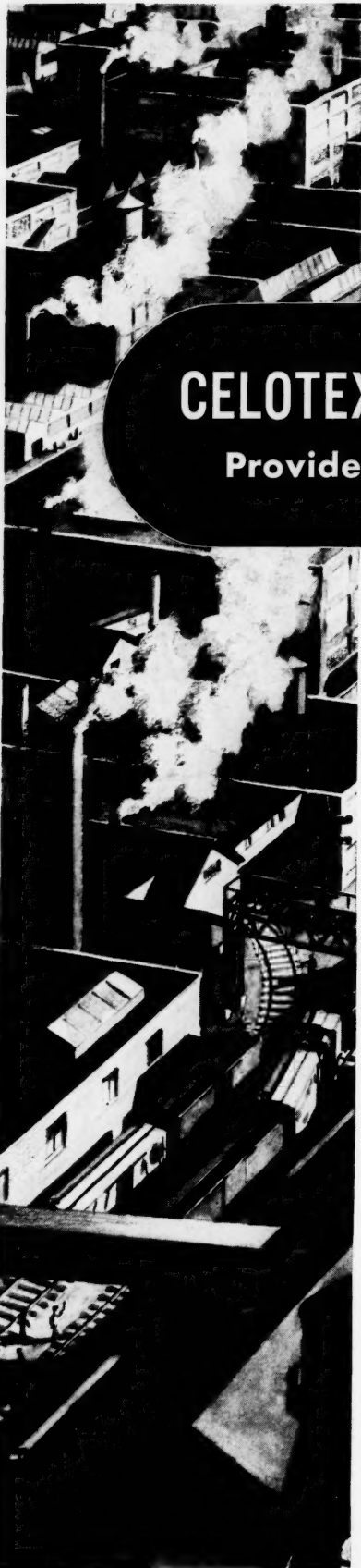
STACKS
REFERENCE
DO NOT LOAN

Give Top Sergeants a Chance at Them

In times like these when able bodied men go on strike they cannot claim to be either self supporting or supporting their families. They certainly cannot claim they are supporting their country.

Why should not such men be drafted into the armed services? They would then support themselves. They, through their allotments and additional government compensation would support their families, and they would soon learn in supporting their country that it is more important than a labor union.

JUNE, 1943



EXPERIENCED BUILDERS AGREE:

**The only economical roof
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CELOTEX BONDED BUILT-UP ROOFS

Provide Years of Trouble-Free Protection!

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to be *good* roofs to meet Celotex world-famous standards of quality.

There's real economy in such long, trouble-free protection. That is why Celotex Bonded Built-Up Roofs have been chosen to guard vital war plants all over America. You may be sure that any contractor who is licensed to apply Celotex Built-Up Roofing Products really knows his business.

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300 feet of "Lightning" that knows how to strike!

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Slim, sleek, and deadly, the D-E's are propelled by Diesel engines and manned by crews who know how to do the job assigned them.

Many of the Diesels for Destroyer

Escorts and other U. S. Navy warships are of Fairbanks-Morse manufacture. The skill, facilities, and engineering experience that have given Fairbanks-Morse Diesels a world-wide reputation for dependability are now being used to provide dependable power for U. S. Navy craft—when dependability is so important. Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago, Ill.





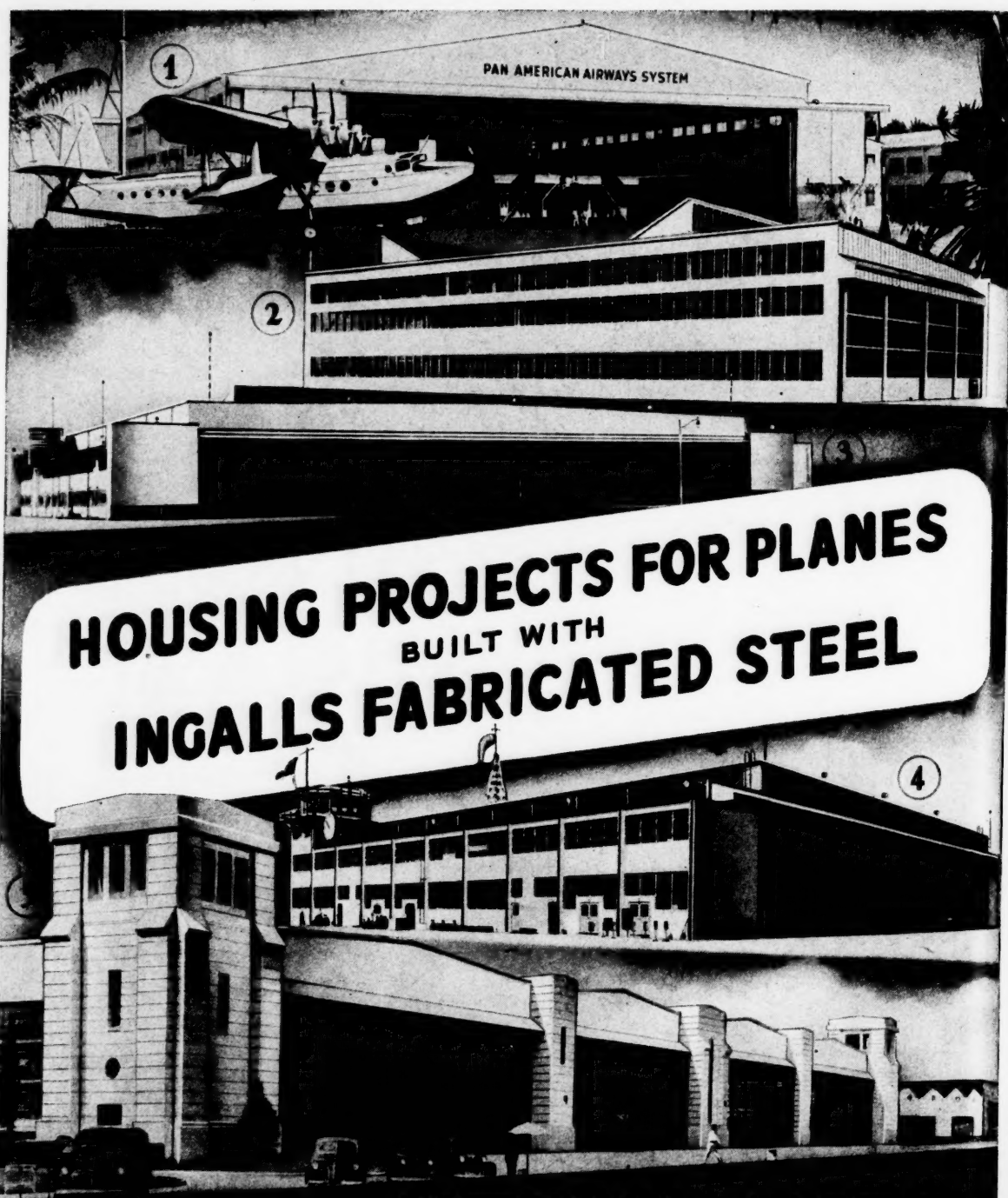
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MANUFACTURERS RECORD

Established 1882

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JUNE, 1943

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With W.A.B. Pneumatic Control Systems it is possible to centralize all maneuvering operations in compact stations located in the engine room, pilot house, or both. ★ engine starting and stopping, speed regulation, clutch engagement, and rudder control, are accomplished by means of a few small levers, directly "under the thumb" of the responsible officer. Manipulation is effortless, action is prompt, positive, and extremely flexible. Interlock features assure that any established cycle of propulsion equipment operation cannot be varied through ignorance or error. ★ W. A. B. Pneumatic Control Systems — the result of three generations of experience in the art of pneumatics — are already installed and performing satisfactorily on many vessels of varying types. They are proving to be the simplest and most reliable method of control, considering their adaptability for concentrating a number of co-ordinated maneuvering functions at one station.

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The routing and handling of mail, especially at large centers, will be done more quickly and the final delivery expedited.

The Post Office states it has asked no deferments from army or navy for any of its employees, although many thousands have joined the armed forces.

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All mail sent to this publication, both letters and parcels, should bear the address —
MANUFACTURERS RECORD, Baltimore 3, Md.

Southern Editors Speak

Two outstanding editors of Southern newspapers have so lucidly and logically expressed in their columns their beliefs on two entirely different subjects that are in the minds of all thoughtful people who love their country and respect the rights of their fellow citizens that it is just not possible to omit quoting them in full on these pages.

States Rights and the demagogic play of politicians for votes from their dupes are these two subjects. Both of these subjects are deserving of the widest thought that their intelligent presentation merits. It is a pleasure for the MANUFACTURERS RECORD to call its readers' attention to these two editorials and to enlarge the field of wisdom that they seek to fertilize.

YES, WHAT?

The MANUFACTURERS RECORD prints on the cover of its May issue the full text of the Tenth Amendment to the Constitution: "The powers not delegated to the United States by the Constitution, nor prohibited by it to the States, are reserved to the States respectively, or to the people." The magazine inquires, somewhat impertinently: "What has happened to the Tenth Amendment?"

The answer is obvious: the Tenth Amendment is dead. Truly enough, it has not been accorded the decencies of a Christian burial. It has never been repealed by due process. But it is none the less dead on that account. Only political antiquarians even quote it and no one obeys it.

Yet the Tenth Amendment was among the Bill of Rights amendments to the Constitution. It was added to correct a grave omission in the original organic law and to allay the fears of the Jeffersonians. It was intended to insure the people against the usurpations of a highly centralized government.

For all the hopes that once gathered about it, the Tenth Amendment is dead, as dead as the men in grey who fell on the scarred slopes of Gettysburg. It is the victim of the studied disobedience of Presidents, Congresses and Supreme Courts. The people have given consent to this murder with their silence.

This is, of course, a rather shabby way to treat a provision of the Constitution of the United States. If the Tenth Amendment can be done to death in such a fashion, then what guarantee is there that the amendments dealing with civil rights will not be similarly burked? Of course, there is no such warranty. Precedents, established on lesser things, overthrow us sooner or later, on the larger things.

There is no profit in ruining the fate of the Tenth Amendment. It can not be resurrected. Public opinion which in the last analysis is the bulwark of any constitution apparently has no tears to waste over this dead provision. But there is assuredly no harm in reminding ourselves that there is at least one provision

of our much revered Constitution which our courts, our lawmakers, our Presidents do not observe.

—Asheville Citizen.

SOCIAL SECURITY UNSOUND

The other day one of the leading insurance experts of the United States asked this question: "Who is to pay the bills for the proposed social security program—and who will be any happier under such a 'cradle-to-the-grave' regimented security?"

The question is, who? That should echo throughout the country. Mr. Fischer is convinced that the cost will be prohibitive, and that life, and other forms of insurance, are cheaper and far more beneficial, while more democratic.

"Social security programs, no matter how worthy," he said, "are never self-sustaining. The government has no money which it does not take from the citizens in the shape of taxes. . . . The workers and industry must carry the load, and are under compulsion to do so. Industry, therefore, must pay high wages, and must have large profits, or capital will not be available. . . . No nation ever became great by fixing its eyes upon security."

The cost of the plan outlined by the administration will be not less than 15 billion dollars a year, or one-eighth of the national income. Life insurance is far cheaper in the long run, and through it the people do things for themselves instead of submitting to the dictates of a paternal government.

In California, home of the "ham-and-eggs" pension movement, already the legislature has increased the monthly pension for the aged, constantly growing in numbers, to \$50. Of this amount the state is to pay \$25, the federal government \$20, and each county \$5. But even now the advocates of more and bigger pensions are moving heaven and earth to raise the amount to \$60. Then they will demand \$75, and further on \$100. What is the limit? Only actual bankruptcy can stop them.

Social security there, and all over the nation, in Washington and in every state capital, is deep in politics. Powerful pressure groups have been formed and are becoming more influential with the politicians. This was all foreseen by those who had studied the history of such socialistic ideas.

The Social Security Board has estimated that in no great length of time the plan will call for total contributions from labor and capital of around 30 per cent of pay rolls. How long can the country carry such a load?

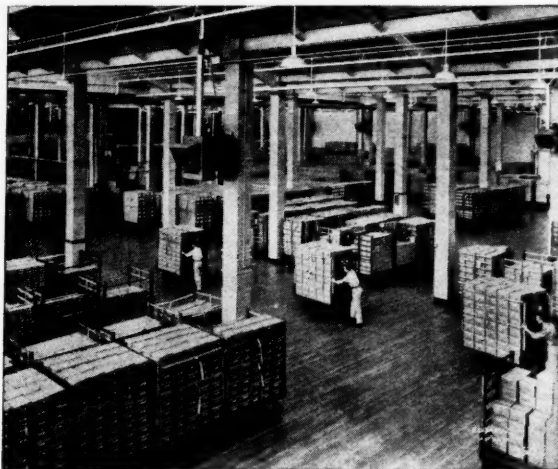
It is significant that in Britain, and before the Beveridge plan has been adopted, total expenditures on social security had risen from \$162,000,000 in 1901, to \$2,047,000,000 in 1937. Since then the figure rapidly has mounted. If the Beveridge plan goes into effect the total will be more than twice what it is today, perhaps three times as much.

The whole concept is anti-democratic, socialistic, and vicious. Security can never be guaranteed by the state, and if it could it would destroy the virtues, personal effort, private initiative, self-reliance, thrift, on which alone great nations in the past have been built.

—The Lexington Leader.

MAPLE STANDS UP

... on The Alleys!



It Stands Up Just As Well In Floors

Ever see a tenpin crack, or split, or splinter? Or, see wood take greater punishment with less mark of abuse?

It's Northern Hard Maple—and the same tough-grained resistance to crushing wear and tear makes Hard Maple best for heavy-duty floors! It takes everything punishing traffic can give it and comes back, neatly and clean, for more.

Hard Maple's resistance to wear means low upkeep cost. Traffic moves easily, safely, over its smooth, non-slippery surface. Comfortable under foot, it resists spots and stains, is thoroughly cleaned by brushing when properly finished. And bright, clear Hard Maple floors reflect light, improve illumination.

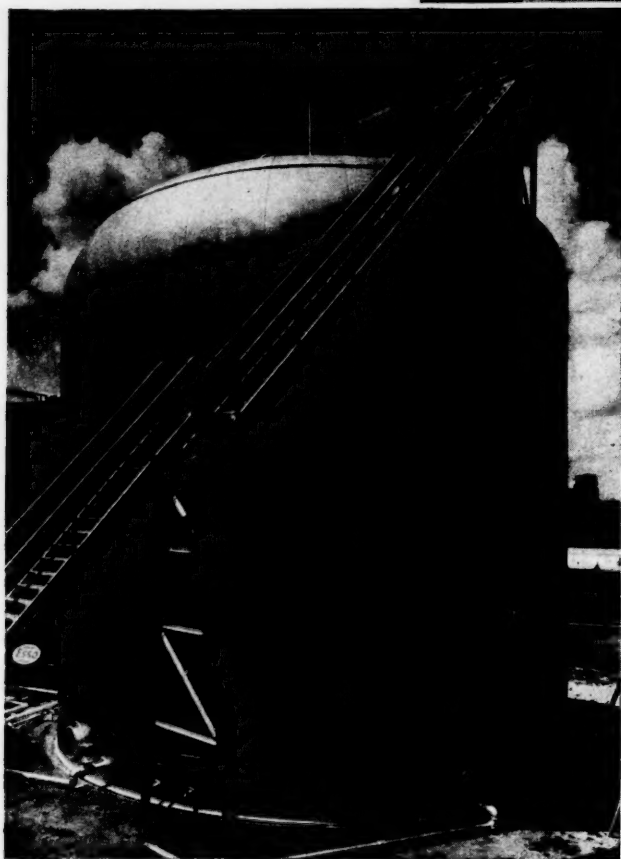
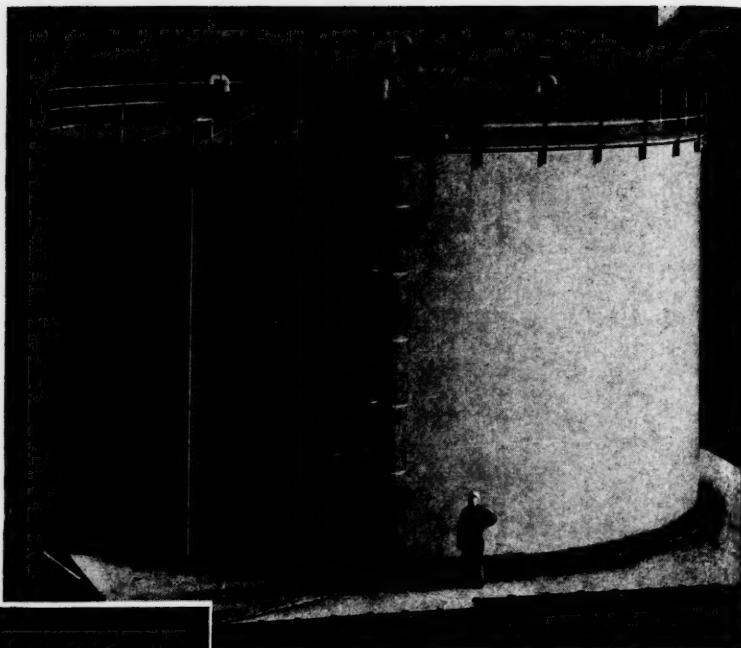
The superiority of Northern Hard Maple for flooring in war industry and food plants, textile mills, defense housing, stores, schools, and other public buildings, is acknowledged. Whether the job is reconstruction or new, consider Maple. In strips or blocks; see Sweet's, 11/57. Ask your architect.

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Write for illustrated literature featuring grades, specifications, etc.



TANKS THAT
Conserve
**VITAL
 WAR
 MATERIALS**



IN the storage of many critical war materials such as alcohol, toluene, butanes, natural gasolines and aviation fuel, it is absolutely essential that maximum protection be provided against volumetric losses and product deterioration.

Cotton oil and molasses must also be protected during storage, and conserved today more than ever before. Many chemical and process industry plants handling these and similar materials have solved their storage and handling problems through the use of modern Horton steel tanks such as the two welded units illustrated here.

Thousands of other types of tanks to meet more complicated storage problems are also serving various industries everywhere.

ABOVE—Specially designed cone-roof tank used for storing molasses.

LEFT — 12,500-bbl. Hemispheroid used for storing volatile petroleum products at 2-1-2 lbs. per sq. in. pressure.

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and GREENVILLE, PENNSYLVANIA

MANUFACTURERS RECORD FOR

3000 Tanks FROM THE YANKS



• Conservation at home is a vital factor in the supply of our armed forces. During the past two years, hundreds of miles of sturdy, long-lasting Lock Joint pipelines have been built to supply vital war projects, yet in the very construction of these lines, more than 80,000 tons of ferrous metals have been conserved for the war

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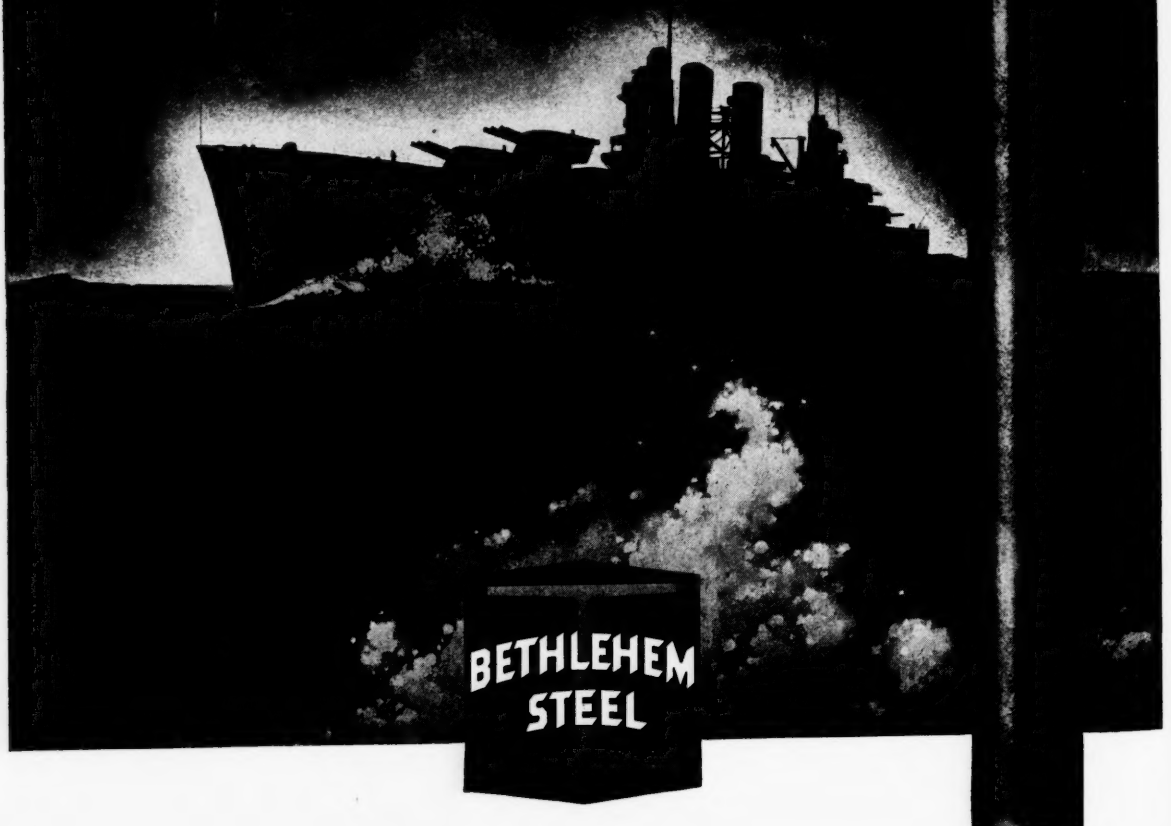
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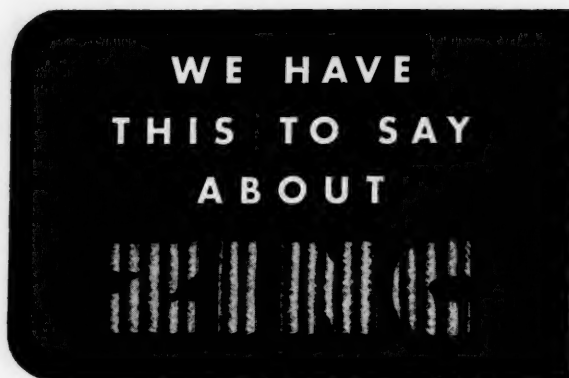
Lock Joint Pipe Company specializes in the manufacture and installation of Reinforced Concrete Pressure Pipe for Water Supply Mains as well as Concrete Pipe of all types for Sanitary Sewers, Storm Drains, Culverts and Subaqueous lines.

LOCK JOINT
Reinforced Concrete
PRESSURE PIPE

BETHLEHEM PIPE fights on the sea



During April our company completed designing and construction of buildings and site improvements for a synthetic rubber plant now operating in the South; finished extensive additions to research facilities of a large corporation in the East; completed and put in operation two units of a large metal making plant in the far West; received the Army-Navy "E" for designing, building and equipping a complete chemical plant in the middle West. Our experienced specialists are available to discuss present or post-war engineering, construction or equipment problems with you. The H. K. Ferguson Company, Engineers and Builders, Cleveland and New York.



We like zinc.

In fact, we recommend it regularly, not just as a war emergency, mind you, but as a standard prescription to be taken side-by-side with aluminum in certain chemical applications.

What's more, we put a modicum of zinc into a few of our good Alcoa Aluminum Alloys, to make them do certain things better.

There isn't any battle of metals that we know anything about, either past or future.

The real battle ahead is industry's task of making jobs when this thing is over. If making a part out of zinc, for instance, will make more people buy it and create more jobs, then zinc it ought to be.

That is another way of saying you ought to be curious about zinc, really curious, if you are one of the Imagineers who are springing up by the thousands. These are the men who are letting their imagination soar,

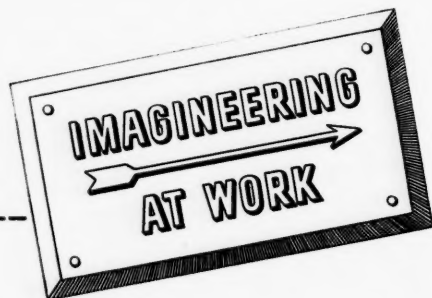
and then engineering it down to earth, *getting ready*.

We believe the practice of Imagineering is one spark that will light the flame of the fifty-five million jobs needed after the war. We believe in Imagineering with every known material and every war-born scientific development you can get an inkle of.

Sooner or later every Imagineer must come smack up against the potentialities of Alcoa Aluminum, the import of new levels of cost, new techniques, and new alloys. You won't find the answer to everything in Alcoa Aluminum, but you will find some magnificent surprises.

Many Imagineers have already told us so. And with the help of such advice on Alcoa Aluminum as we can squeeze in the time to give, they are already several steps along in their postwar plans.

ALUMINUM COMPANY OF AMERICA, 2109 Gulf Building, Pittsburgh, Pennsylvania.



Alcoa Aluminum





Flying Drives!



New, Improved Link-Belt Silent Chain increases efficiency of Aircraft Controls!

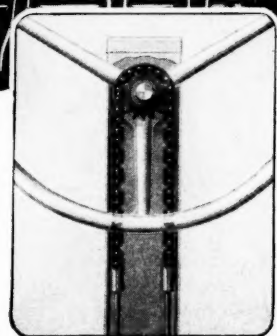
Chain can fight, too. It's doing a big war job in many types of fighting equipment as well as on the production front. New types—designed for high precision performance—are helping make our planes, our tanks and other vital weapons the finest in the world. Link-Belt engineers have helped solve many critical design and production problems by their ingenious and efficient applications of chain. Link-Belt, through its vast experience and extensive producing facilities, has developed and expanded its line of chains and sprockets into scores of standard types and sizes for every conceivable purpose. Wherever chain is needed—for power transmission or for conveying—remember, it's Link-Belt for Chain!

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LINK-BELT *for* **CHAIN**



Link-Belt Precision-Built Aircraft Silent Chain is a special development, to meet the needs of the aviation field. The distinctive tooth and link form of this improved chain minimizes the effect of chordal action and assures smooth, positive operation even over extremely small sprockets.

9099-A



A close-up view of a 5-room house



A close-up view of a 4 1/2-room house

NEW AND ENLARGED HOUSING for post-war industry moving South

INDUSTRIALISTS making a study of plant locations in the South will find the one problem of housing adequately met at Port Wentworth, near Savannah, Ga. Facilities for office employees and junior executives, and for workers both white and colored, are now available. The Village of Port Wentworth is an up-to-date, permanent development, with houses of the very best construction materials: brick foundations, hardwood floors, Crane plumbing and fixtures; electric ranges and refrigerators.



Healthful conditions abound; no crowding, plenty of space for fresh air, outdoor gardening and other forms of recreation. The lots are more than average size.

Port Wentworth housing is not a war project in the sense that the houses are thrown together quickly with cheap materials. New houses have been built like those here illustrated and older houses are remodeled. Most of the houses have five rooms and a few are smaller.



The Town of Port Wentworth has been carrying out a plan of public improvements to care for the increased number of workers and families. Expansion of the water works plant more than doubles its former capacity, new streets are built and old streets improved.



Industrialists seeking Southern plant locations will find every major requirement for ideal war and post-war manufacturing plants.

Ask for information on housing, transportation, raw materials and other requirements to meet your specific problems.

PORT WENTWORTH CORPORATION

New York—17 E. 42nd. St.

Savannah—Box 1094

One of the many streets where the new 5-room houses have been constructed



"I never thought the time would come..."

I never thought the time would come when it would be appropriate for me to say:

"Please don't ride on a Southern Railway train this summer—unless you conscientiously believe that your trip is necessary."

But that time has come... an inescapable by-product of our Nation's fight for Victory!

You see, the Southern serves the South—and the South is serving the Nation as the location of many important war industries going at top speed and more than half of all the larger training camps and military establishments in the country.

This means simply that our passenger facilities this summer will undoubtedly be strained to the limit.

Many of our passenger cars and locomotives will be assigned to troop movements.

Our regular trains and our stations are bound to be literally jammed with men and women in uniform, traveling under orders and on fur-

lough, and civilians traveling in connection with war work.

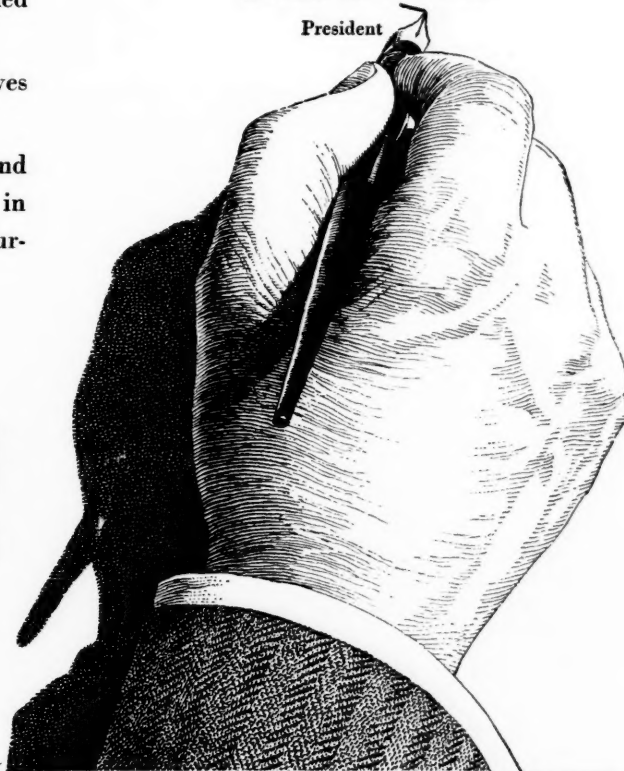
We're going to do our level best to handle this heavy load, including those civilians who conscientiously believe that they must travel.

But, until our trains and stations are no longer over-crowded by essential travel, we hope that you will patriotically forego all unnecessary travel over our lines.

I never thought the time would come... but it's here... and I know that we can rely on your cooperation and understanding.

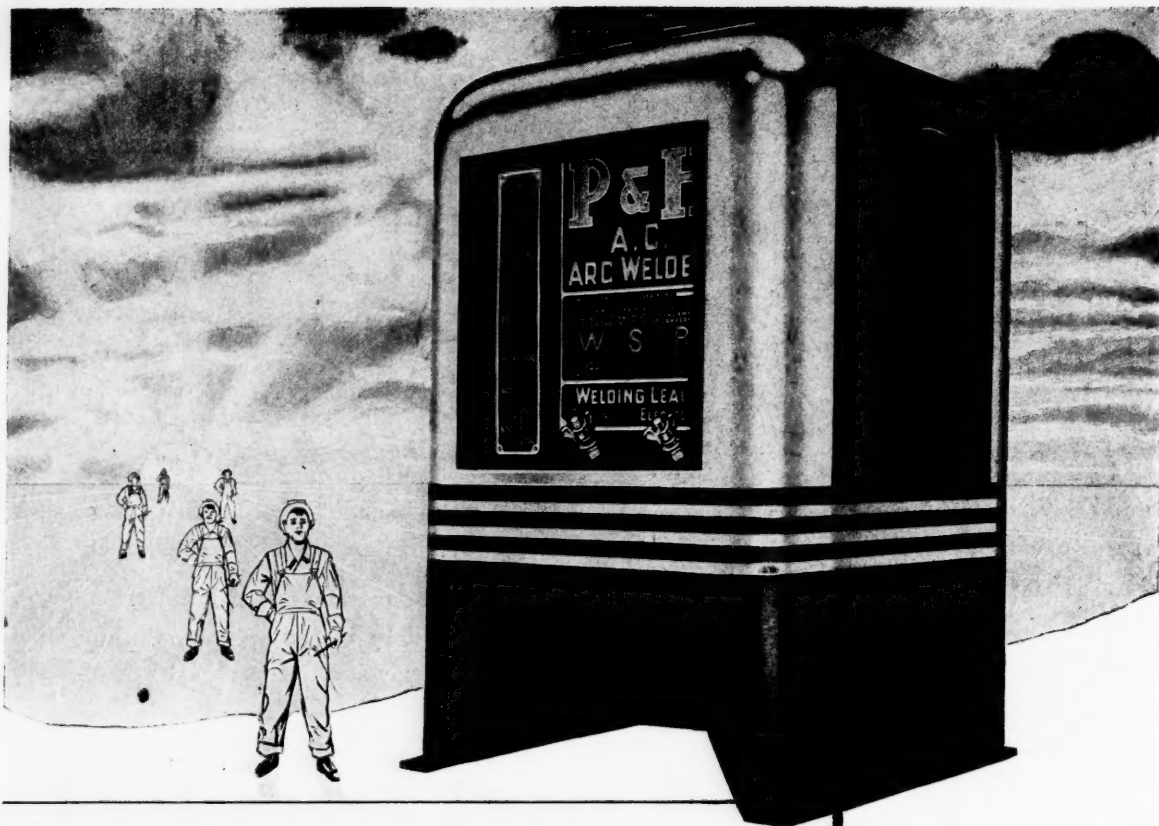
Ernest E. Harris

President



SOUTHERN RAILWAY SYSTEM

The Southern Serves the South



What about These New A.C. ARC WELDERS?

TO be worthy of the P&H name plate, these new A.C. Arc Welders incorporate every modern refinement which experience and engineering skills can provide.

Industrial Models

The complete line embraces two different series of industrial machines (for intermittent and heavy duty service) with a wide range of capacities. To speed up and maintain welding on a high production basis, all models provide the continuous, concentrated arc which is so easy to control.

Rated on W.S.R. Basis

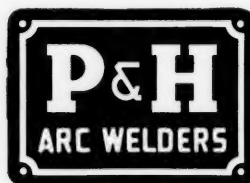
All models are rated on W.S.R. (Welding Service Range) which designates each machine's usable welding current. Actual delivered output from minimum to maximum capacity is clearly specified.

One Simple Control

Following P&H's policy of utmost simplicity in operation, these new A.C. Arc Welders have

but a single control. Requiring no locking, blocking or other auxiliary devices, this creep-proof micromatic control provides continuous current settings from minimum to maximum capacity. Advanced design and the use of highest quality materials throughout, assure extremely high operating efficiencies. Literature on request.

P&H builds a complete line of A.C. and D.C. Welding equipment as well as a full line of welding electrodes.



General Offices:

4427 W. National Ave., Milwaukee, Wisconsin



Canadian Distribution: The Canadian Fairbanks-Morse Company, Ltd.

LET'S GET THIS JOB DONE Now!

• To many little boys, war is just a game to play . . . like "Gangsters," "Indians," or "Pirates."

But to this little boy, war means something different! His daddy has gone away, maybe for a long time . . . possibly forever.

• To him war means a lonesome, longing childish heart—a void that only a father can fill.

Yes—we *must* work and fight with every ounce of strength and skill we have—we *must* make far greater sacrifices . . . before this little boy, and many thousands like him, can again have their daddies home.

For all these little boys, then—and their mothers—and their soldier-fathers—LET'S PRODUCE MORE, *FASTER!* They are depending on us for the ammunition, equipment, and supplies that mean a quicker Victory.

The Gulf South is *IN* this war. Its people, its resources, its mighty industries are joined with the rest of America in the grim race to outproduce and outfight our enemies.

Buy War Bonds . . . Help America's Victory!



The Gulf South

Working with All America for VICTORY

This Advertisement Published by

UNITED GAS PIPE LINE COMPANY

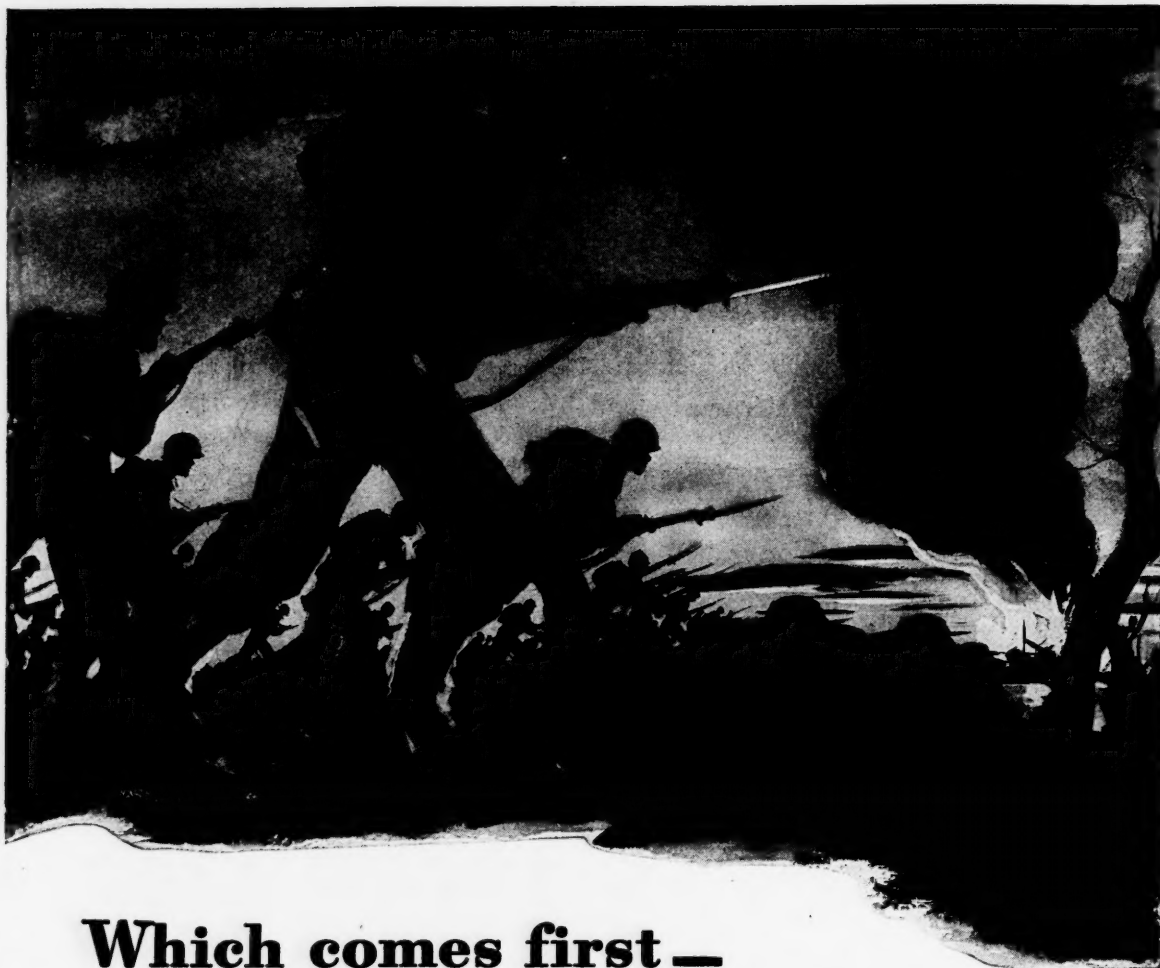
A Natural Gas transmission Company built in peacetime . . . now dedicated to serve wartime fuel requirements throughout the Gulf South.

FOR TEXAS, Mail received at: Beaumont, Dallas, Fort Worth, Houston, Longview, San Antonio and Wichita Falls. FOR LOUISIANA, Mail received at: Baton Rouge, Lake Charles, Monroe, New Orleans and Shreveport. FOR MISSISSIPPI, ALABAMA and FLORIDA, Mail received at: Jackson, Miss.

CCPR., 1943, UNITED GAS PIPE LINE CO.

JUNE NINETEEN FORTY-THREE

17



Which comes first — Your second helping? or our second front?

YOU WANT TO SEE THIS WAR WON — and won quickly. You want to see it carried to the enemy with a vengeance. Okay—so do all of us. But just remember...

A second front takes food... food to feed our allies *in addition* to our own men.

Which do you want — more meat for you, or enough meat for them? An extra cup of coffee on your breakfast table, or a full tin cup of coffee for a fighting soldier?

Just remember that the meat you don't get — and the coffee and sugar that you don't get — are up at the front lines — fighting for you.

Would you have it otherwise?

Cheerfully co-operating with rationing is one way we can help to win this war. But there are scores of others. Many of them are described in a new free booklet called "You and the War," available from this magazine. Send for your copy today! Learn about the many opportunities for doing an important service to your country.

Read about the Citizens Defense Corps, organized as part of Local Defense Councils. Choose the job you're best at, and start doing it! You're needed—now!

Contributed by the Magazine Publishers of America

EVERY CIVILIAN A FIGHTER
MANUFACTURERS RECORD FOR

From the ground up



Weighing the charge for a cupola at one of our plants, drawn by Hugh Ferriss.

Few pipe buyers realize the extent of the inspections, analyses and tests involved in our step-by-step control of the quality of Super-de Lavaud Cast Iron Pipe. Production controls *start* almost literally from the ground up with the inspection, analysis and weighing of raw materials—*continue* with the constant control of cupola operation and analysis of the metal from the forehearth;

the synchronization of the rotational speed of the mold, travel of the casting machine and pouring rate of the iron entering the mold; the automatic temperature controls of the heat-treating furnaces—and *end* with inspections and a series of acceptance and routine tests of the finished pipe. You can get this pipe promptly if you can obtain the necessary priorities.

UNITED STATES PIPE & FOUNDRY CO.

General Offices: Burlington, New Jersey. Plants and Sales Offices throughout the U. S. A.

THERE'S CLEAN COOL WATER

**RIGHT UNDER
YOUR PLANT**

**... and a
WORTHINGTON
TURBINE
WELL PUMP
will deliver it
to you as needed**

Water
Lubricated
Type

Oil
Lubricated
Type

Either as a main or a subsidiary source of water, a Worthington deep well installation offers many advantages attractive to far-sighted management. The assurance of a reliable supply of pure water, independent control in emergencies, approximately uniform low temperature throughout the year... all important points in long-range economy.

Products of the world's largest pump builder, Worthington turbine well pumps incorporate developments in construction and materials that are based on a century of hydraulic experience and on successful installations in virtually every industry.

- A type and size for every requirement... up to 10,000 gallons per min., 700 ft. head, 1000 horsepower.
- Open or closed shaft... water-lubricated or oil-lubricated.
- Designed for low cost operation... minimum friction, full-stream-lined water passages.
- Rugged construction... with plus features that mean years of service.
- All types of drive... electric motor, steam turbine, diesel or gas engine, flat-belt or V-belt.

» Write for large-size cross-sectional chart showing details of important mechanical and hydraulic features.

WORTHINGTON



DW3-2



FREEDOM FROM SHAME

Biologists and philosophers have not been able to contradict Darwin's theory of the survival of the fittest. The present world conflict is certain proof that it applies to mankind. The unprecedented development of America by men who proved that they were the fittest is conclusive evidence that the same theory applies to Americans.

Man is born in labor and in pain. Man's development from the cradle to the grave depends upon the strain from which he is bred and the environment in which he is reared and continues to live. He inherits certain basic characteristics and qualities. He develops these, first through the influences of his parents, and as he grows older, by the example of friends and associates.

Why do able boys become able men? Is it because the President Roosevelts and Senator Wagners are prepared to assure them that they will have an all powerful Simon Legree who will see that they have plenty of corn pone and cracklings as long as they are willing to feel the crack of the whip? Or is it because these boys, growing to be men, have preferred and will prefer to take their lives into their own two hands, face the world with the confidence of individual freedom, and neither ask nor expect quarter unless it is deserved and earned?

Men are not made by being coddled. Men are not made by being shielded from fear. Men are not made by filling their bellies. They are made by the divine inspiration that is in their souls that they can accomplish things for themselves and that they welcome the strife of a competitive society—yes and even a war with other forms of society that challenge their own.

Man, as we know him in America, is neither a slave nor a guinea pig. He is a MAN, an intelligent, self-disciplined animal who knows that if he has freedom from fear and want that the fibres of his character will weaken and that he will face the fact that he cannot escape freedom from shame.

A wartime message to plant maintenance engineers

Today, when every order is rush and so much depends upon America's unmatched production schedules, leaky roofs can result in costly slowdowns.

To the hard-pressed maintenance engineer, Barrett offers these timely suggestions:

1. Call on Barrett or your local Barrett Approved Roofer to make a thorough inspection of the roofs on your plant...*before trouble develops, not after.* Roof failures have a way of happening at the most inopportune times.

2. If roof maintenance or repair is advisable, engage the services of a Barrett Approved Roofer. His organization is composed of trained roofing men, who know roof ailments and how to correct them. Don't pull your own men away from their

production jobs to send them up on the roof; the Barrett Roofer can do that work quicker and with less trouble to you.

3. If you are expanding your facilities by opening up unused sheds or warehouses—or building a new plant—roof with materials that won't let you down. Barrett Specification* Roofs applied according to Barrett Specifications have demonstrated their unmatched ability to provide trouble-free protection against the weather.



50 City Blocks Under One Roof

Barrett Roofs are today serving on America's production front. On one new huge war plant alone Barrett Roofs protect an area of 50 city blocks.

Again your Barrett Approved Roofer is the man to help you. He's an experienced roofing expert, chosen for his "know-how" in handling all kinds of roofing problems. He'll be glad to take your "overhead" problems off your mind—for the duration and for many years to come.



THE BARRETT DIVISION

ALLIED CHEMICAL & DYE CORPORATION

40 RECTOR STREET, NEW YORK

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Barrett Specification* Roofs...Barrett Built-Up Roofs...Shingles and Sidings...Roll Roofings...Rock Wool Insulation...Roof Coatings and Protective Products



When They Come Home

There is, and should be in a free country, a great deal of talk (it would be more encouraging if it could be called thought) about post-war planning. The star gazers gaze at the stars. The chiselers sharpen their chisels. The racketeers restrung their rackets, and they all overlook the one important element that will control the future of our nation and possibly of the world.

Millions of our men are being cast in the same mold now that produced the Daniel Boones, the Sam Houstons, the Davy Crockets and the Wild Bill Hickoks. They are being taught to be tough. They are being deliberately taught because that is the only way to lick a treacherous and clever enemy. They are taught to be tough, but above everything else, they are taught to be fair and generous to their comrades. These men—and they will be men when they return—will not want their lives planned by political doctors with soothing bedside manners. They will not want to beg for jobs already filled by others. Above all, they will not want to pay tribute to a labor organization for the right to start to work and continue to pay it for the right to continue working.

If a post-war world is to be planned it must be planned to adjust the economic ideas of the present civilian population to those of the men who are now making and will make our civilization possible. If we do not re-absorb them, they will take matters in their own hands because that is just exactly what they are being trained to do now.

These same men have learned, and are learning the advantages of unified leadership coupled with individual initiative. Is it possible to suppose that they will be satisfied with a condition that demands disloyalty to the men who will pay them in order to turn over part of that pay to men who live on it alone

or be branded as scabs for their loyalty to their own company?

This system of divided loyalty was tried during the early days of the Russian revolution. There were commanding officers and there were Bolshevich commissars. The military were in apparent command, the revolutionaries were undermining their authority. Where are the commissars today? Where have they been since Stalin began building a truly great army? The cold, vast reaches of Siberia might be able to answer that question.

Our Nation has become great because its citizens are motivated by a fundamental, individual principle. They believe that they have the right to protect and care for themselves and their loved ones and when the war is over they will demand it. They will not be satisfied with the dole or any other kind of government handout. It must be remembered that these fellows are and will be men and that they will expect to "go places and do things" on their own. They will expect opportunity. They will demand the freedom to seize it.

The men in our armed forces when they return will not tolerate for long a government that dictates one day and pleads the next. They have been accustomed to taking orders from men who were thoroughly trained, men who not only knew their jobs but really did them. They will expect leadership from their leaders, not words from their mouths.

All of this adds up to one simple answer. The planners may plan. The star gazers may gaze. The schemers may scheme, but the truly patriotic American, when he makes his own decision, either economic or politic, will ask himself "What will my boy think of me and of all the other men that make up America when he comes home."

A hard-long-road...



... a road of bitter fighting and heavy casualties, of sacrifices, setbacks, and disappointments — stretches ahead of America in this war.

It is the road of hardest realism. We must get on that road and stay there — for it is the only road to Victory.

A little good news here and there does not reveal the unforeseeable future. It does not erase the cold fact that we are fighting what is still the most powerful military machine in the world — a machine which cannot be beaten except by one more powerful. And that more powerful machine is still in the making here in America.

We have made a start, but today, as never before, there is a desperate, vital need for more work, harder work by more civilians on the home front.

We can be thankful for our great American industry, our unrivaled inventive genius, and our railroads, which are producing and moving the machines of war, without which we would have no chance to win the war.

On the road of hardest realism we must remember this: the development of America and what we have were made possible by the very things we are fighting to preserve — opportunity, individual initiative, and private enterprise. These basic human rights are our strongest weapons in war and in the peace which we will win.

NORFOLK and WESTERN Railway
ONE OF AMERICA'S RAILROADS ... ALL UNITED FOR VICTORY
BUY MORE WAR BONDS

Appeasement Is Weakness

A policy of appeasement is a confession of weakness.

If a "bully" is appeased he will continue to "bully." He must be licked.

This piece of knowledge that all of us learned in our boyhood applies to national politics and international diplomacy, as well as to individual boys and men.

Consider the case of England since the 1920's. Following her traditional foreign policy she wanted a balance of power among the great nations on the continent of Europe. She failed to support France in realistic policies toward Germany until it was too late, because she felt that it was to her advantage to have a nation powerful enough to act as a buffer state between communist Russia and a communistically inclined France. When the mistake of this policy was perceived the second mistake was made—APPEASEMENT. Instead of being in firm hands, the future of England was in the hands of a man who carried an umbrella because he feared it might rain. He carried the umbrella home from Munich unopened—and then came the cloudburst—Czechoslovakia, Poland, Norway, Belgium, Holland, France, Yugoslavia, Greece and finally Russia. England had to defend herself in a more desperate situation than any she had faced since the Napoleonic wars.

APPEASEMENT had not worked. The "bully" had licked the little fellows, one at a time.

Now England realized that APPEASEMENT IS WEAKNESS. She put a man of firm and determined

character in power to represent her and really went to work.

The result is making history. It is also setting an example.

In the spring of 1933 our government thought that there should be an economic balance of power between capital and labor. It apparently feared that if unrestricted, the social structure of our country would evolve into a plutocracy, and it also saw that political advantage could be gained by encouraging class hatred. Just as England, in a diplomatic way tried to create a balance of power for her own benefit on the continent of Europe, our government attempted a like policy here at home. It fostered and encouraged a schism between labor and capital so that it could use one against the other and maintain its own pre-eminence as the balance of power between the two.

But just like England our government fostered and reared a child that fell into evil hands. The child grew and developed bad habits. It was not spanked and put to bed. It was APPEASED instead. Its father's hands were tied by the mother who gave it birth and coddled it. Now the father who pays the bills stands idly by while the mother wrings her hands in despair and all of us are bedeviled by a spoiled brat.

The brat has been appeased long enough.

England's example of APPEASEMENT should be perfectly clear handwriting on the wall for every American.

Is Washington to be our national Munich? Is Mr. Roosevelt to be our Chamberlain?

"Whither Goest Thou"

Our wizards in Washington give forth a lot of prophetic vaporings upon almost every subject under the sun. It is a matter for speculation whether some of their ideas were not conceived under the influence of moonshine—but certain gaps in the verbiage that they promiscuously scatter for public consumption are very often more informative to intelligent people than the words that they so often use for purely political purposes.

As an outstanding illustration of this gap between suppositions that are publicized and hard boiled economic truths consider the following: The administration's "guesses" that the cost of the war will amount to \$300,000,000,000. Of course it is only guessing because it has no definite idea how soon the war will end nor how great an effort its winning will take.

The administration knows with reasonable accuracy that the assessed valuation of all of the real and personal property, tangible and intangible, in the United States is \$150,000,000,000.

In other words, assuming that the administration is correct, we will come out of this war owing twice as much as we have to pay it with. A private business under similar circumstances would be declared

bankrupt unless its creditors were convinced that its future earning capacity was such as to enable it eventually to pay off its obligations.

No amount of trick theorizing can conceal the inescapable economic fact that a debt must be paid either from the earnings of the debtor or by liquidation of the debtor's assets. In this case the debtor is a combination of the national resources and productive genius of America. The creditor is not the government of the United States. It is you and me and all of us who have insurance policies, bank accounts, stocks and bonds, even money in our pockets, all worthless unless backed by government solvency.

What policies is our government now adopting to see that when the war is over our national economic system will be in a position to pay gradually its obligations to all of its citizens? Are we being led on the road to national liquidation, debt repudiation and state socialism or will the American system of free enterprise be given a chance to earn its way and pay the debt due all of us. It only can be done under laws that recognize individual initiative and the co-operation of a government by public servants, not masters.



Above—Butadiene, one of the two main ingredients in synthetic rubber, is stored at the new \$56,000,000 plant now being finished at Institute, W. Va., in nine tanks such as those shown above. Each holds 30,000 gallons of the butadiene gas, which is liquefied under pressure. Three tanks of similar size contain the styrene. Together, the tanks have sufficient ingredients to operate the plant three days, or the equivalent of 190,000 passenger car tires in raw material form.

West Virginia's \$56,000,000 Rubber Plant Placed in Operation

Left—An inhibitor is added to the stored butadiene to prevent premature polymerization. This agent must be removed before the liquefied gas is pumped to the reactor area. The view left is of the complicated chemical apparatus which removes the inhibitor.

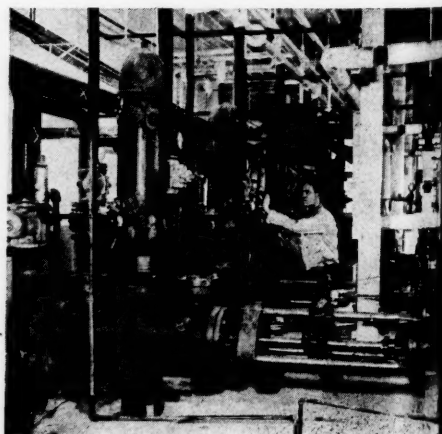
Right—The butadiene and styrene and many special chemicals are pumped through pipelines from the storage to reactor areas. Part of this intricate circulatory system is illustrated.

WEST Virginia, where enterprising industrialists seized a first world war opportunity to develop a thriving chemical community from what in other sections lapsed into industrial "ghosts," is making further gains in the realm of the test tube and the retort that promise to push the Mountain State further to the forefront as an international center in the science of producing substances that rival the very best Nature can create.

The latest advance is a huge plant which is rapidly moving into capacity output of synthetic rubber, with a second 30,000-ton unit now nearly finished and a third unit scheduled to be in production by July. Located at Institute, the project is costing \$56,000,000 and is announced as the first of the Federal Government's large integrated synthetic rubber plants complete at one location. Its product is known as Buna S.

Raw materials for the process are being manufactured by Carbide and Carbon Chemical Corp. The new plant is being operated for the Government by the United States Rubber Co. At full capacity it is expected that 90,000 long tons of synthetic rubber will be turned out annually, about one-fourth of the country's present consumption for military and essential needs, excluding the demands of the Lend-Lease program.

Production of natural rubber equal to the Institute plant's output, even on high yielding plantations, would require nearly 90,000 workers to tap twenty-four million Hevea trees on more than a quarter





of a million acres. The Institute production, it is pointed out by United States Rubber officials, would be enough to make 63,000 passenger car tires daily, if all the synthetic rubber were used for this purpose.

The Institute plant is described as an integrated chemical unit in the sense that at one location and in one continuous flow, the basic raw materials are produced synthetically and then converted by polymerization to Buna S synthetic rubber. Buna S producing facilities comprise the substantial proportion of the current synthetic rubber plant construction program. Neoprene and butyl are among the other types of the synthetic product.

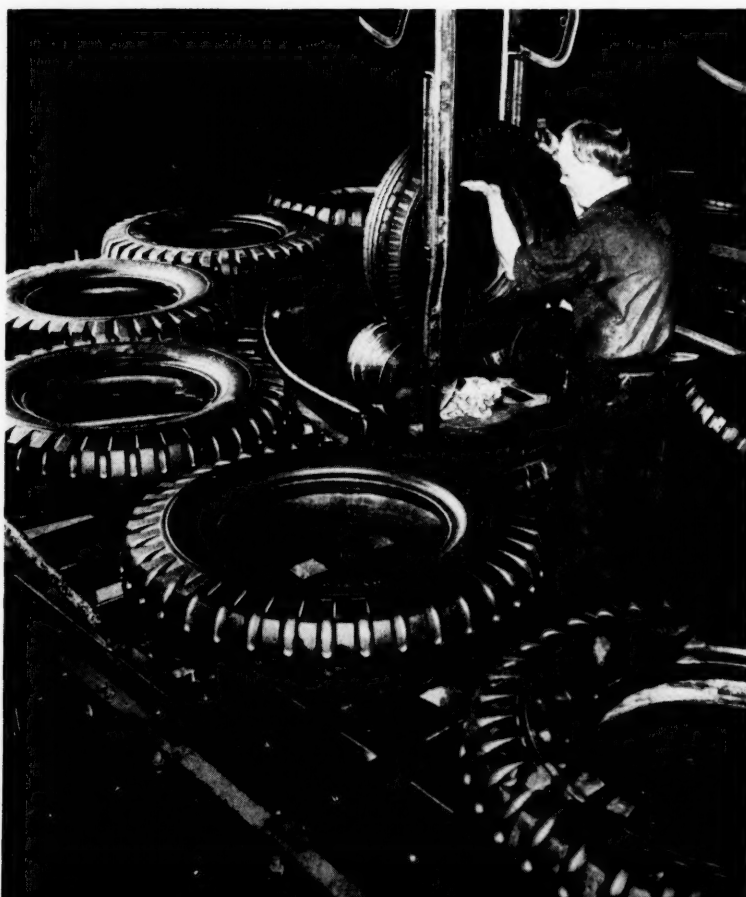
Major problems which the rubber program is designed to overcome, according to an outline made several months ago by William

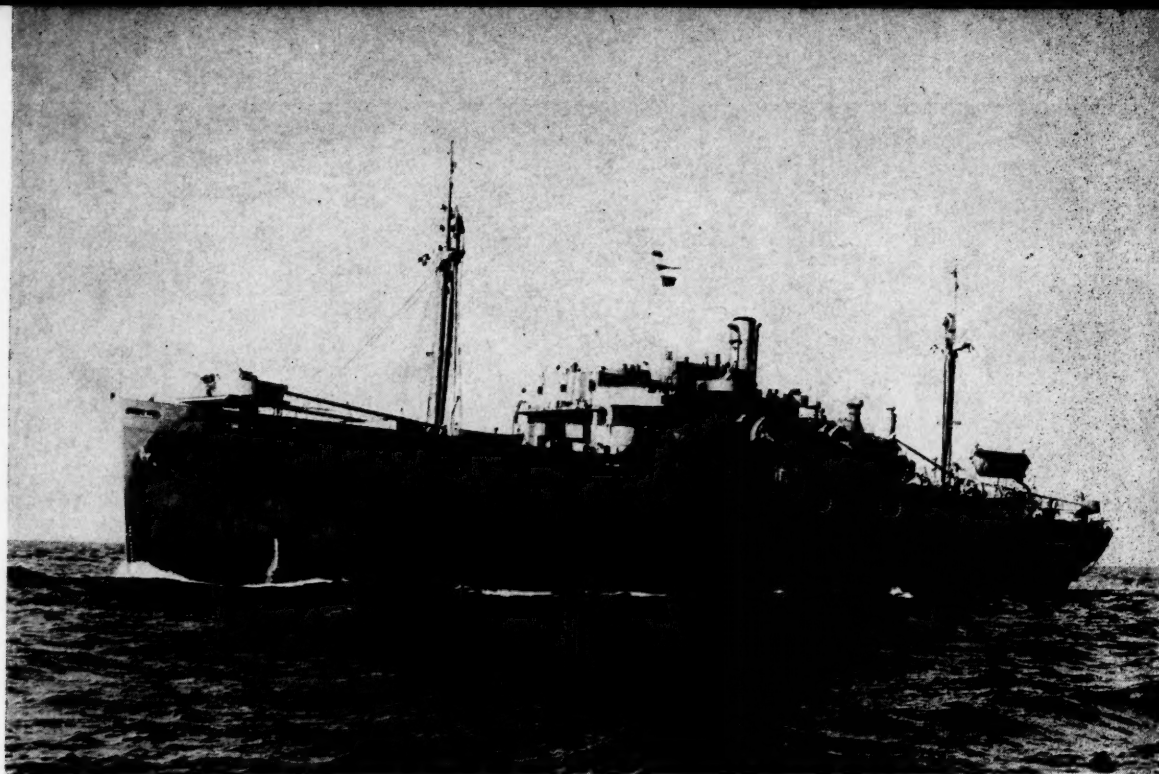
(Continued on page 48)

Right—These are synthetic rubber tires, material for which is being produced at the new \$56,000,000 plant in the heart of West Virginia, where shortly after the last war, one of the world's most important chemical centers was developed from what might have been "ghost" reminders of the tremendous industrial expansion of 1918. The new Institute plant is rapidly coming into full production. Its second 30,000-ton unit is scheduled to be completed this week. The third will be in production by July. The plant covers 77 acres. The 90,000-ton annual capacity is enough synthetic rubber for one-fourth of the present consumption for military and essential civilian needs, exclusive of Lease-Lend gift. To produce this enormous tonnage of natural rubber would require 90,000 workers tapping 24 million Hevea trees over an area of 250,000 acres of British rubber plantations on the Malaya peninsula of southeastern Asia.

first unit capacity equal to latex from 24 million Hevea trees

Above—The fourth step in the synthetic rubber making process is called polymerization. This takes place in the huge glass lined vessels shown above at the left. Seventy-two such reactors are installed in the \$56,000,000 plant being placed in operation in West Virginia by United States Rubber Co. for the Government. When polymerization reaches the proper point, the emulsion is run-off to other large vessels called "blown-down" tanks. After the batches of synthetic rubber latex are blended, certain dilute chemicals are recovered and the synthetic product in the form of flocs or crumbs is washed and excess water removed. The middle picture shows this operation. At the right is the drying equipment. The Buna S, the type of synthetic rubber being made at Institute, is dried by passing back and forth three times in twelve enormous driers.





Luxury Liner Answers War Call

SHE was conceived as a grand and luxurious lady.

And on the day they laid her keel down in the Magnolia State, where R. I. Ingalls had not long before opened the nation's first strictly all-welded shipyard, they dreamed of the day of her debut, when she would glide out into the blue Gulf Stream with bands playing and flags fluttering, to join the gay company of United States Liners as the S. S. American Merchant.

She would have magnificent staterooms, and bars and game decks. She would have space for

*plans for gay
passenger ship
changed to
troop carrier*

race horses and polo ponies, and kennels for canine aristocrats who went globe-girdling. She would be all that a sophisticated world traveler could ask in lush, commodious quarters and up-to-the minute equipment.

So was the vessel conceived.

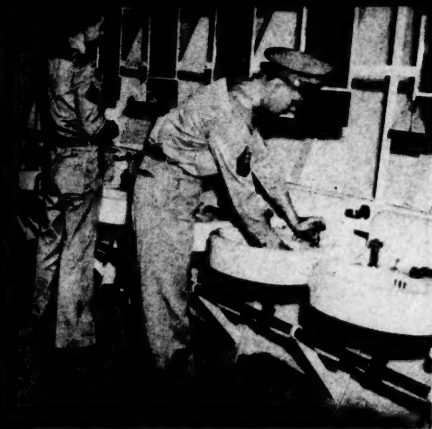
But things changed. There was Pearl Harbor, and other prenatal influences. And when finally the time arrived, and the shipway delivered her to the sea, it was a different world—and a different ship as well.

Instead of the gleaming white paint, and red, she wore a dull coat of battleship gray. Instead of spacious staterooms and ballrooms and cocktail lounges she is, below decks, barren of luxury and as efficient as a barrack. Indeed, she was a barrack—a floating barrack—with canvas cots for Johnny

Above—First of her type to be built since the start of hostilities, the former Pascagoula was planned as a luxury liner for the United States Lines. Grim in her battleship gray, where originally white and red were to be applied, she is now operating as a unit of the Army Transport Service. An 18,000-tonner, she cost \$7,500,000. Ore for the steel in her hull was mined in the hills around Birmingham. The Ingalls Iron Works made the shapes and Ingalls shipbuilders welded the parts together on ways on the shores of the Singing River at Pascagoula, Miss.



Left—Officers are quartered in staterooms equipped with modern furniture, double-deck beds, reading lamps and telephones.



Above—Washrooms of a size to insure the cleanliness of large groups of troops, such as carried on an 18,000-ton transport, are equipped with long stretches of washbowls, each with its individual mirror. (Press Association photos.)

Doughboy lining the bulkheads where the Beautyrests were planned to be.

On her decks where the shuffleboard and tennis courts were to have been there were gun turrets, fore and aft. And instead of sweeping majestically out into the Gulf at high noon with bands playing, she shoved off in grim silence into a soupy gray dawn, her keel cutting waters infested with enemy submarines.

She wasn't the luxury liner S.S. American Merchant then. She was the S. S. Pascagoula, temporarily named for the town that built her. And when that trial run was over she was to be renamed again—by the Army, which took her over for the United States Army Transport Service.

Aboard her as she slipped out of the outfitting dock was the Ingalls trial crew—and a delegation of observers from the Maritime Commission, the Army Transport Service and the Navy, plus Naval gun crews.

First thing out was a complete checkup and adjustment of navigating instruments and Degaussing equipment, the stuff that neutralizes the attraction of magnetic mines. The Maritime Commission and the Army Transport Service both had to be convinced all was in perfect shape; they were taking no chances with this, the first Army transport built as such since the start of the war.

new transport far ahead of similar ships of first world war days

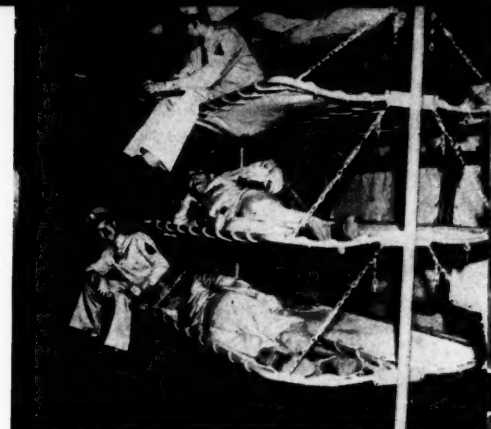
The Associated Press quotes one of the official observers on the bridge as saying:

"A transport like this, if kept moving full speed ahead and on a zigzag course, hardly would be a target for a submarine. She can outrun and outmaneuver a submarine and any undersea craft would have to get in a mighty lucky shot to sink her. It would have to be at the right place at the right time."

Said a Briton of His Majesty's Navy: "I'm surprised. The ship is much faster than a comparable British-built ship."

The command came, "Hard right rudder!"

She swung sharp to starboard, quickly, easily, without missing a beat or a throb. Then the orders came thick and fast.



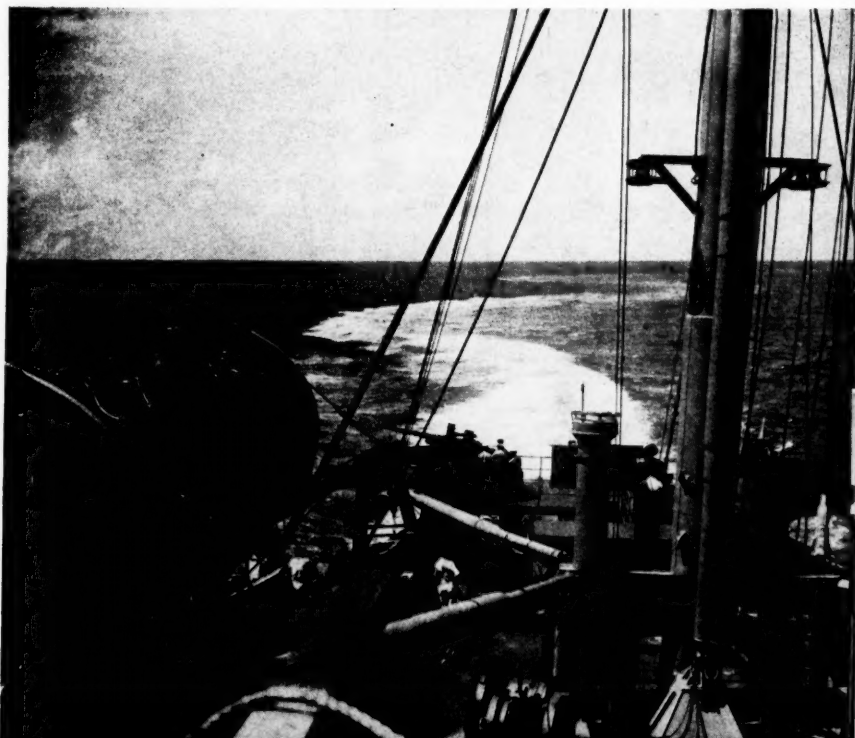
Above—Every transport is practically a floating barrack. On the ship that was to have been the S. S. American Merchant, canvas cots occupy space originally intended for comfortable staterooms, ballrooms and cocktail lounges. The cots turn up during the daylight hours to make room for recreational activities. Shift sleeping is not necessary. Other conveniences are a soda fountain and a snack bar.

"Stand by for a crash stop!" the loudspeaker bawled.

She was switched from full speed ahead to full astern. It was the final exam. It was something she probably would never be called upon to do, but something she had to

(Continued on page 50)

Below—Speedy and maneuverable, the Ingalls built vessel is shown as she snaked a course during her trial run, while Army, Navy and Maritime Commission observers watched and checked her every move. Reminders that a war is in progress are the gun platforms seen through the stays.



SHELLS OF STEEL

—
*mass
output
starts
of cases
formerly
made of
brass*
—

STEEL cartridge cases are now being produced in increasing volume by the Buick Motor Division of General Motors.

From huge machines converted from former automobile production, large caliber steel shell cases are rolling in vast quantities to supply United Nations guns on the world's battlefronts with deadly efficiency, Harlow H. Curtice, Vice President of General Motors, and General Manager of the Buick Division, recently made public.

The process for steel shell case manufacture has been in successful operation for many months, and cases of the 75 millimeter size are now being produced in increasing volume and of high quality.

Describing the development as "one of the toughest jobs in the history of military production" and at the same time one of the most critical assignments in view of the need to conserve copper, Mr. Curtice said its accomplishment is the result of close cooperation between metal working technicians and the

Above—Faced with a critical situation of not enough copper to make ammunition brass for the United States and its allies, the War and Navy departments asked for ideas on the subject of producing cartridge cases from steel. As a result of experiments by the Buick Motor Division of General Motors Corp., already one of the country's largest producers of war equipment, steel cartridge cases will soon be in volume production. Two of the requirements for such cases are that the metal will expand rapidly enough to seal in the gun breech during the explosion and that the metal will contract enough afterwards to allow easy ejection of the shell case. Above is a view of the shells moving along the conveyor line. Below is a steel shell case as it progressed forming operations from the bar to the finished product.

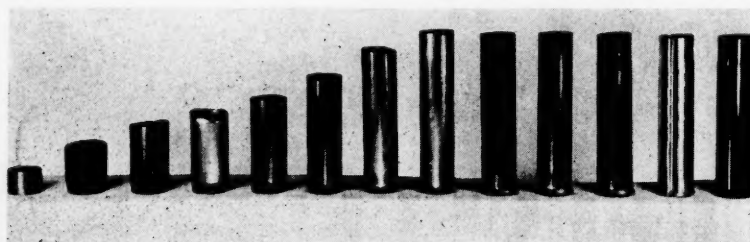
Army Ordnance steel shell case committee representing a large section of the American metal working industry.

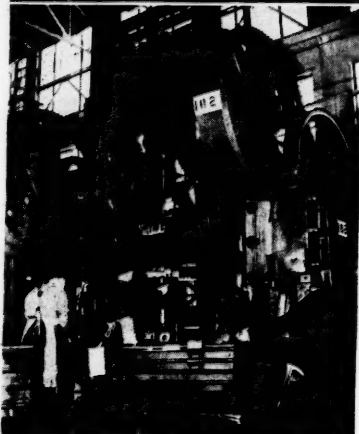
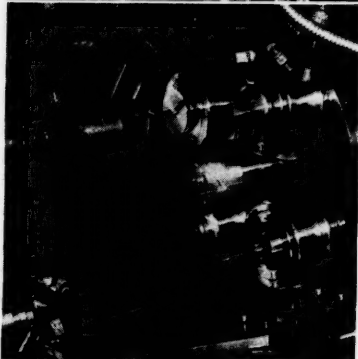
The process which was developed involves extrusion and cold working of bar stock steel, drawing it into the size and shape of a 75 mm artillery shell case and providing

it with the high physical properties required in firing. It has been made available to the government for use by other manufacturers without license and is now in use in the production of other shell sizes.

The steel shell cases replace cases made of brass, of which the principal component is copper. At the current production rate of steel cases the conservation of the critical copper metal runs into thousands of tons. At the same time, steel cases are interchangeable with brass shells and are fully capable of operation in guns designed originally to take this formerly plentiful ammunition.

The manufacturing job, it is explained, is a difficult one. There is virtually no permissible tolerance in the physical properties of the steel shell case. If too hard or brittle it will crack when fired; if too soft the explosion pressure will cause it to stick in the gun barrel. Hence very accurate control of manufacturing processes is necessary.





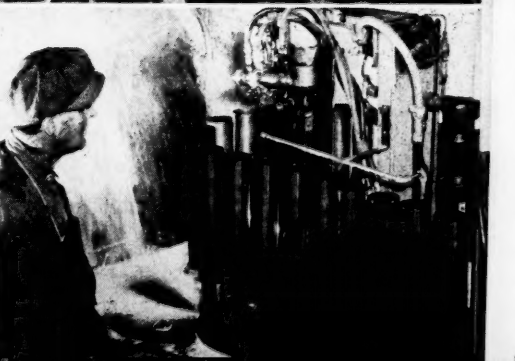
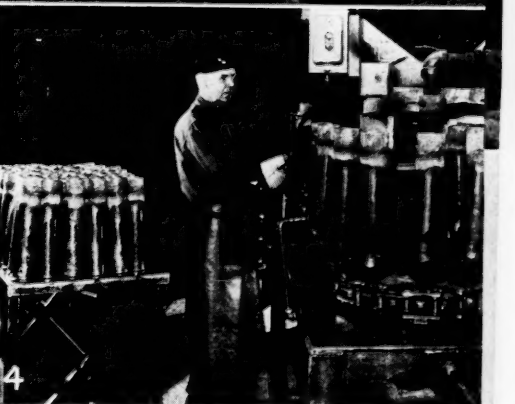
Above—(top)—Two hot cupping operations are used. The second is the same as the first, except for a slightly altered tool extending the draw two inches further, or to about six inches. The operation shown in the lower picture is the cold sizing of the shell case cup head in a crank press. The middle view is a close-up of the automatic lathe used for machining the base. A case is in position.

"The purpose of a cartridge case," Mr. Curtice said, "is to act as a container for the explosive charge, to prevent the escape of gases resulting from the explosion and to permit rapid firing. The wall of the case must be elastic

Right—(1)—Hot extrusion is one of the early steps in the process, the work being done on a standard forging press. (2)—One of the most interesting steps is the series of four cold drawing operations, all carried out on a single 750-ton Clearing double acting press. Depth of the draw varies slightly over the four dies, this being controlled by length of the punch. The cartridge case progresses from the left hand die to the right hand die on one side of the press and is then handed through the die opening and placed on the die directly opposite the second station. Four operators handle the press. The six-inch cup is drawn to 15 inches and to the approximate form of the finished case. (3)—The case is cold headed in a press equipped with a two-stage indexing die. The lower is moved after the first stroke to bring the second die impression under the punch carrying the case. The base is flared in this step to make the expanded rim from which the flange is machined. (4)—The flame anneal before tapering. The cases are mounted on a conveyor and moved between two rows of 2½-inch radiant gas burners. Temperature is closely controlled and the anneal is limited to two inches at the mouth to prevent splits during tapering. (5)—Painting the baking are the final operations. The specified coating to prevent corrosion and sparking is an unpigmented baked phenolic varnish, prior to application of which the cases are pickled in phosphoric acid to provide the bond for the paint and also as additional protection against corrosion. Painting and baking are fully automatic. The cases rest on fixtures attached to the conveyor chain so that as they pass the spray nozzles they can be spun by a motor driven rubber belt. One nozzle is mounted on a traveling base which descends into the case and sprays the rotating surface. Outside nozzles are positioned to coat the base and wall. After coating, the cases are carried between two banks of infra-red lamps. Temperature in the baking zone approximates 360 degrees Fahrenheit. Time required for baking is 48 minutes.

enough to expand under the explosive pressure and make a tight seal against the breech wall of the gun. Unless it is properly supported by the breech wall, the pressure developed is sufficient to burst any case. A certain amount of clearance is necessary between the cartridge case and the breech wall to permit ease of loading and ejection under field conditions. The cartridge case must expand, first to take up this clearance, and continue to expand as the breech diameter increases due to the explosion pressure. The case must have enough elastic recovery to allow easy ejection after firing, and in contrast to the high physical properties required in the body of the cartridge case, the mouth must be annealed or soft-

(Continued on page 51)

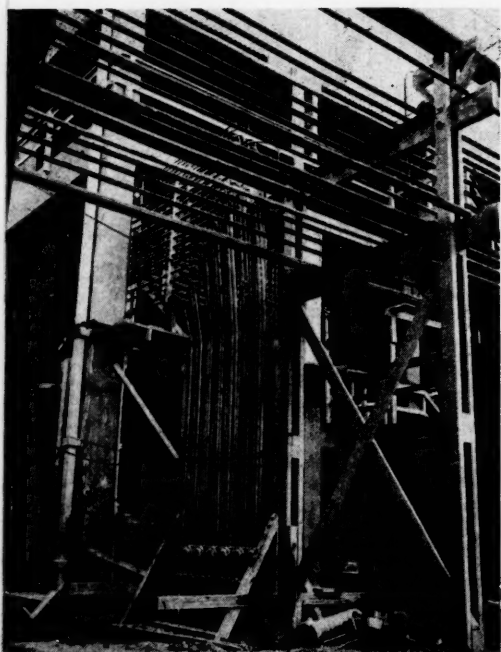




Non-Critical Material Use Hastens Rubber Project

ECONOMY in design highlighted the speed construction program at the recently completed, Government owned

synthetic rubber plant at Baton Rouge, La. Buildings for the plant were designed and erected by the H. K. Ferguson Co., industrial engineers and builders of Cleveland and New York, under management supervision of the Firestone Tire & Rubber Company. Equipment was installed by the Blaw-Knox Company of Pittsburgh. The plant will be operated by the Copolymer Corporation, an organiza-



Above — Polymerization, the process which unites the molecules of butadiene and styrene to form synthetic rubber, starts in this tank farm at the new plant being operated at Baton Rouge, La., by Firestone Tire & Rubber Co. Butadiene, a petroleum derivative, comes from a separate adjacent plant to the polymerization unit and is piped from the spherical tanks in the rear to the tanks in the foreground. Walkways and scaffolding are built of timber instead of steel critically needed for other important uses.

Left—An interesting aspect of the new plant is the miles and miles of piping necessary to the process. This scene is fairly typical. Vertical piping encases electrical wiring for control of the many re-actor tanks. Horizontal overhead piping contains the butadiene, styrene and various other chemical agents.

Below—G. B. Panero, project manager for the H. K. Ferguson Co., industrial engineers and builders of Cleveland and New York who constructed the plant. Equipment was installed by the Blaw-Knox Co.



Right—(top) Timber girders in the rubber processing building are an example of design economy. The roof is gypsum plank, a non-critical material also. An adequate sprinkler system has been installed in the structure, which has brick walls and concrete floors. Exterior of the building is shown in the middle picture. It includes a large warehouse and utility building. Wood sash is used instead of steel which might have taken several weeks to procure. In the processing building the milky rubber latex is coagulated, sent through a dryer, dropped into a hydraulic baler and prepared for shipment. The recovery structure is illustrated at the bottom. Almost completed when the photograph was taken, it is one of the most complicated in the entire process. Purpose of the two stripping towers is to recover the molecules of butadiene and styrene which do not unite in the reactor tanks. Recovered butadiene and styrene are then recycled to the tank farm and used again. The milky latex solution is piped to the processing building.



tion composed of seven of the smaller rubber manufacturers.

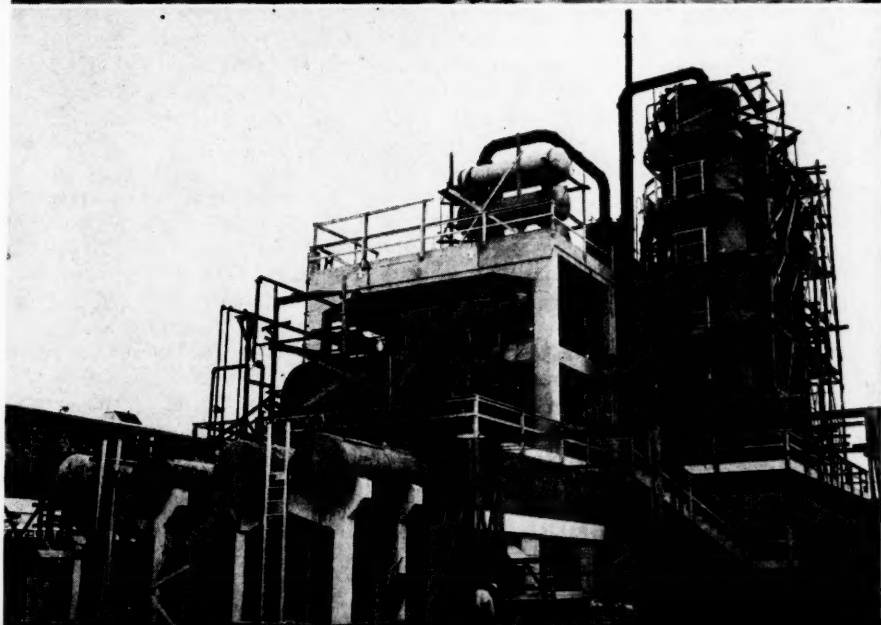
Buildings are principally concrete and brick, with wood columns and trusses. Structural steel was used only where absolutely necessary. The use of metal also was curtailed for walks and runways and for guard rails. Even gutters and downspouts are wood. Many of the tanks that ordinarily would be metal are wood, too. Use of these non-critical materials enable builders to complete the plant in the short span of twenty weeks. First construction dated back to November 15; the first batch of rubber was produced on March 31.

The building program, however, was not devoid of all difficulties and obstacles. "When we couldn't get immediate delivery on heavy power equipment for grading we used every available mule in the territory," Harold K. Ferguson, president of the building firm, explained. "When we saw what rain did to the soft, Louisiana mud, we planked up all our roadways with three-inch boards, and when the mud seeped through the planking, we repeated the operation and put planks atop planks."

The Baton Rouge synthetic rubber plant is, more or less, standardized with many others now being completed in all parts of the Nation. It is located on a tract of ground about a quarter of a mile square. The site is level and has adequate rail and highway facilities. On an adjoining tract is a plant under way for the manufacture of butadiene, one of the principal ingredients of Buna S, and made by a petroleum "cracking" process. The butadiene is piped to the rubber plant.

The flow sheet for the production of synthetic rubber starts in an area called the "tank farm." This consists of rows of large tanks for the storage of butadiene and styrene, another of the prin-

(Continued on page 56)



BUSINESS AT THE CROSSROADS

By

ARMAND MAY

Atlanta, Ga.

PEACE and prosperity can only be attained under law. In that concept I would include "moral laws" which though not always implemented by the prevailing statutory code are nevertheless as valid in their sphere as the law of gravitation in the purely physical world and, at times, as drastic in their effects.

Business men like nations are realizing that the "law of the jungle" is not law at all but chaos, that we cannot achieve political and economic stability unless nations and men adopt a broader view of their responsibilities. Only yesterday it seems the doctrine of "Buyer Beware" was commonly accepted as sound practice. Today we recognize implied warranties, we make guarantees and offer refunds, we appreciate and zealously guard that intangible called "goodwill." Tomorrow perhaps we shall not only strive to make each transaction fair to both parties but we shall also consult the interest of the public as a sort of silent third party.

Illustrating what I have in mind is the approach of the executive of a large industrial corporation to some of the problems of the day. It so happens that this man has had experience as a member of a local draft board. When requests for approval of applications for deferment come through from various branches of his own organization he does not try to see how many men he can keep out of the draft but rather insists on replacement of those who are eligible and not actually irreplaceable, although it would be cheaper in many cases for him to obtain deferments. On another occasion I was discussing the matter of taxes with this same man. When his subordinates suggested that money be spent freely because the Government "stands" so large a share, he takes the position that Uncle Sam needs the money and that one way or another the Government will have to collect a certain amount in taxes, therefore expenditures must still be judged on individual

constructive merit. This, happily, is a far cry from the spirit which was all too rampant at a conference of so-called "Little Business Men" I attended in Washington several years ago. There I saw a conflict of purely selfish interests and I had the feeling that the larger good of the public or of business as a whole had been forgotten.

The fact of the matter is that to preserve private enterprise business has got to cooperate with labor, with the farmer and with government and form an integral part of a social system that provides the individual with the standard of living he knows he ought to enjoy in view of our technological progress. Splendid as its record has been, business cannot rest on its laurels. To long continue, the profit system will have to deliver more goods to more people, will have to modernize to avoid being outmoded. This implies that organized labor will be made responsible and that legislative and regulatory bodies will have to be impartial and judicial rather than political — management can't do the job alone. But through its magnificent response to the war effort business has gained great public confidence and its leadership can exert vast influence, especially if forward looking.

One of the Four Freedoms—Freedom from Want—is peculiarly in the province of business and is closely tied to Freedom from Fear. Men must be assured of an opportunity to earn a decent living wage, steadily and not merely so long as capital is receiving more than a certain minimum return; and they should not find themselves unwanted as the result of scientific advances.

Business might, for example, develop a system of privately oper-

ated publicly regulated insurance to protect against periodic declines or unusual conditions confronting an industry or a single manufacturer. This would simply be an extension of the practice of setting aside reserves for contingencies which many companies are doing today in spite of high taxes, but amounts paid into such a common fund should be tax exempt. To this end, also provision might be made for contribution of a certain percentage of all royalties received from licenses under U. S. Patents.

Furthermore, this insurance fund could be supplemented by a tax of say 10% to be paid on equipment which has been fully depreciated but is still in use; a requirement of depreciation in ten years might be coupled with this. It is not contemplated that such a fund would be permitted to become unwieldy but that disbursements would be continually made in the light of individual need and public interest to keep the economic machine in motion. Naturally, poor risks would not be carried indefinitely.

Our objective must be the maintenance of steady employment for those able and willing to work. New inventions and the impact of political or economic forces may, however, bring about temporary unemployment—through no fault or shortcoming of those affected. Instead of calling these workers "unemployed" I propose a new term, namely "Reservists." These workers are an asset not a liability and these good Americans should be protected from the stigma unconsciously associated with "unemployed." On the other hand, calling them "reservists" will give the public a better appreciation of their value—how valuable is shown by the part being played in the war industry by millions drawn from the pool of former "unemployed."

Every business sets aside its reserves, is attentive to their adequacy, notes them on the balance sheet with pleasure. Let us look with similar esteem upon our labor

(Continued on page 52)

Texas



Speaks!

I.

The newly re-elected Governor of Texas, Hon. Coke Stevenson, has issued this public declaration:

"Texans understand that in time of war we must have unity of command; but that does not mean that Congress, and the States through their Legislatures and Governors, should cease giving consideration to economic and internal administrative issues. Would it be fair to our young men, that while they fight and die in strange lands in the very name of Democracy, we should submit to a course of internal administration of our civic affairs that might destroy the Democracy we have?"

At the same time, our newly elected Lieutenant-Governor, Hon. John Lee Smith, issued this public declaration:

"Washington . . . We demand the utter loyalty of the Government itself to these men who are now rendering the last full measure of devotion to the cause of human liberty. We frankly do not believe you have been loyal to them, when you have turned your head and refused to stop war strikes even as they died."

II.

These two men have been elected recently by the people of Texas.

We believe it safe to say that these public declarations represent the vast majority opinion of our people.

For more than a year of war, we have heard from various public officials about the need for a conscientious effort from our civilian population.

There is no controversy about that.

But it is long past time to have an accounting from Government officials on their own performance.

III.

Why does the Government still permit strikes, slowdowns and absentee periods in war industry?

IV.

We have heard much about "social gains."

We believe that the American System itself (Constitutional Government, Bill of Rights Democracy) is the greatest "social gain" the world has ever seen.

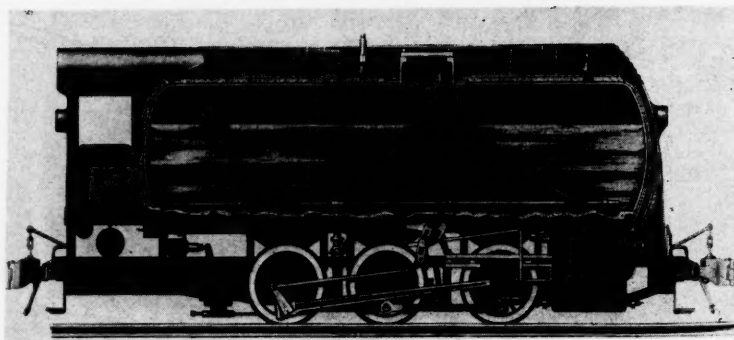
We ask of every public official this point-blank question:

Have you been faithful to your oath of office, to support and defend the Constitution of the United States?

It would be a fruitless thing—a disastrous thing—while fighting the war abroad, to lose it at home.

For the sake of our men in uniform—for the sake of ourselves and our children—we are determined to preserve the American System "against all enemies, foreign and domestic."

[[INSPIRED BY TEXANS FROM EVERY PART OF THE STATE WHO ADMIRE
COURAGE AND FORTHRIGHTNESS OF SPEECH IN PUBLIC OFFICIALS]]



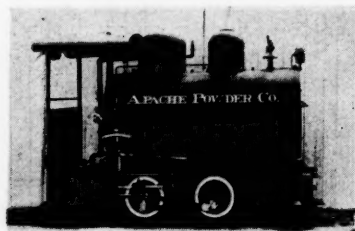
Left—Sectional view of the "thermos bottle" locomotive, showing its heavily insulated reservoir and the charging pipe located within and along the bottom of the reservoir. The brake cylinder is to the left of the rear wheel; the piston valve and cylinder forward of the front wheel. Dry steam is conveyed into the steam dome and to the cylinder through the diagonal pipe inside the reservoir. Fireless locomotives have large cylinders because of low steam pressure used.

Fireless Locomotives

*war makes
new need
for "thermos"
engines*

By

JOHN KENTLINE
*Chief Engineer
H. K. Porter Company, Inc.*



Above—Resembling an exhibit in a railroad museum, the little fireless unit shown at the right weighs but six tons. It is one of the earlier models. The modern, streamlined "Firestone" shown in the view below weighs thirteen times as much. War has increased sizes and uses of these units.



WAR has created the widest demand yet experienced for the fireless locomotive. Originally developed abroad in 1914 the first model of the "thermos bottle" engine was built in this country, the writer having joined H. K. Porter Company, Inc., in that year, shortly before it undertook building the early models.

The fireless unit is now making its greatest contribution in solving problems of locomotive power in a number of specialized war production fields, such as ammunition and chemical works, alcohol distilleries, oil and sugar refineries, and other industries where absolute safety from fire hazard and explosion are a paramount consideration.

The distinguishing feature of the fireless locomotive is the elimination of the boiler and firebox. These are replaced by a large tank, or reservoir. The reservoir stores heat in the form of hot water and steam and must be re-charged when steam pressure has dropped to the minimum necessary to perform the work. Machinery contained in the reservoir includes the charging apparatus, the throttle, throttle rod, and dry pipe. The steam engine and running gear of the locomotive is similar to that of the conventional locomotive. This part of the unit consists of the usual two double acting cylinders with the necessary valves, reversing mechanism, connecting rods, and driving wheels. Because steam is utilized at much lower pressures in the cylinders, the cylinders are much larger than on the ordinary steam locomotive.

They have a piston area $2\frac{1}{2}$ to 3 times as large as the steam locomotive of comparable power. The mean effective pressure in the cylinders may be varied from 80 pounds down to as low as 15 pounds, depending on the loads to be hauled.

Steam for charging the locomotive may be from any available source of plant steam supply, being delivered to the reservoir through a flexible charging connection. A steam supply, with pressure as low as 85 pounds per square inch may be utilized.

The thermodynamics of the locomotive are based on the principle of utilizing hot water as a means for storing energy. When the reservoir is fully charged, 80 per cent or more of its volume is filled with hot water and the remainder with steam. In this charging process, the hotter high pressure steam from the stationary boiler flows through the charging pipe into the locomotive storage tank, heating the water in the tank and raising the pressure of the steam until they are nearly equal to the pressure and temperature of the steam in the stationary boiler.

Within the engine reservoir, the temperature of the water corresponds to that of the saturated steam above the water. For example, if a locomotive designed for steam charging pressure of 165 pounds (gauge) is fully charged, the water is at a temperature of 373 degrees F. For the same conditions, the heat content of the steam is 1196.4 B. T. U. and the heat of the water is 345.6 B. T. U. per pound. The latent heat of vaporization is 850.8 B. T. U. per pound.

As part of the steam is drawn off and utilized in the locomotive cylinders to perform work, the

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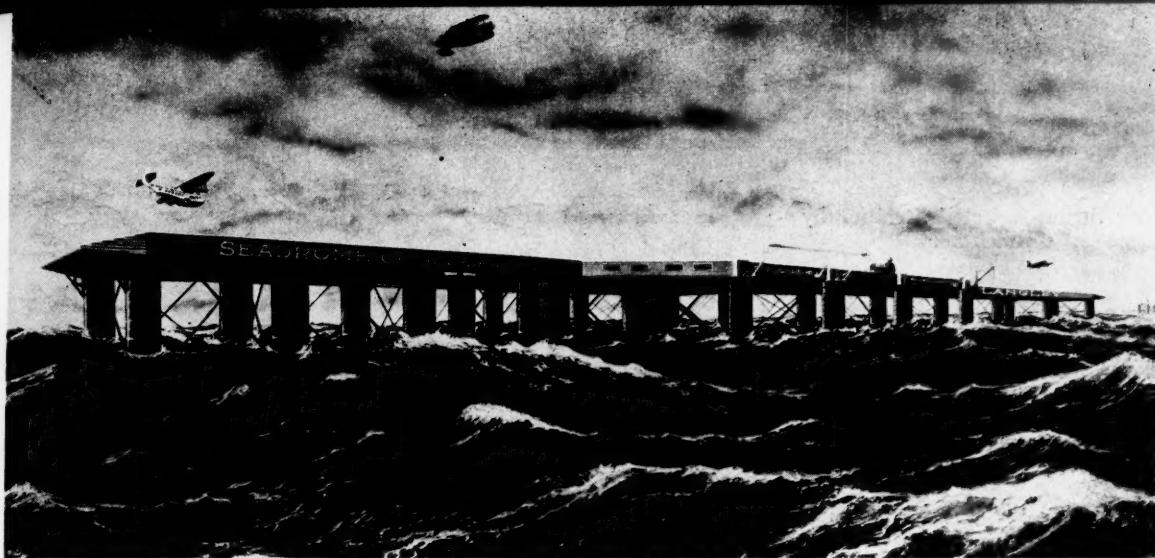
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Landing Isles Proposed for Transatlantic Plane Routes

would be open to all companies and all nations with one of the chief advantages being a sharp increase in pay-load made possible by the more frequent re-fueling as the air transports hop the shorter distances between the floating airports instead of flying the entire route in one continuous trip.

(Continued on page 60)

Above—Under the 3,500-foot long landing deck would be a second deck for accommodation of passengers and crew, pilots. A third deck 28 feet high will contain hangar space, repair and inspection facilities and will be connected with the top surface by elevators. The fourth deck will house the machinery, lighting and radio and other equipment. Ample storage space will be provided for gasoline, water, stores and oil. The seadrome would be equipped with electrically driven propellers. Ocean waves on the north Atlantic are of such short duration, says the inventor that the 64,000-ton vessel would not be affected. Cost of a seadrome is estimated at \$12,500,000.

OCEAN bases for servicing planes traveling Transatlantic skies were proposed last month by Pennsylvania-Central Airlines and a group of American business organizations, which applied to the Civil Aeronautics Board for permission to establish the "seadrome" route between the United States and the British Isles.

The floating "flat-tops" under the plan outlined in the application

Right—Edward R. Armstrong, Philadelphia engineer, who developed the floating ocean airport idea is shown with C. Bedell Monro, president of Pennsylvania-Central Airlines, which filed for permission to fly the safer over-the-ocean route to be established. To be built when steel is available, the vessels will rise 70 feet above the sea, extend 160 feet below the surface. Numerous vertical buoyancy tanks make up the substructure and support the landing deck.



New Methods

New Steam-Jacketed Strainer by Blackmer

A new strainer for handling highly viscous liquids or liquids that are solid at room temperatures has recently been announced by the Blackmer Pump Company, Grand Rapids, Michigan. Steam-jacketed strainers are used to maintain the liquid in the strainer at the same temperature as in the piping and were developed primarily to speed the handling of difficult liquids in war production plants.

Standard capacities are 20, 50, 100 and 200 GPM. Pipe sizes, 1, 2 and 3 inches. The 1" and 2" (50 GPM) units have threaded pipe connections. The 2" (100 GPM) and 3" units have flanged connections. Maximum operating pressure is 50 psi at temperature of 600° F. The jacket is suitable for 125 lbs. steam pressure.

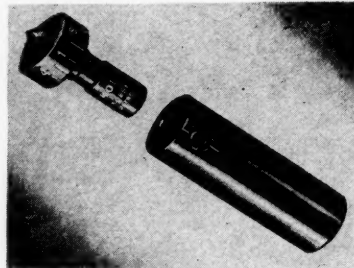
The bottom and sides of the unit are completely enclosed in a steam jacket. Two inlet and two outlet ports are provided for steam line connection.

Promotions At ARMCO

J. B. Tytus has been elected vice president in charge of technical development for The American Rolling Mill Company, and F. E. Vigor has been elected vice president in charge of manufacturing and mining operations. Charles R. Hook, president, has announced. Mr. Tytus has been vice president in charge of operations at Armco, and is internationally known as the developer of the continuous method of rolling iron and steel sheets. Mr. Vigor, until recently, served as assistant director of the Steel Division, War Production Board, Washington, D. C.

Mr. Tytus, who was graduated from Yale in 1897, started to work in the Armco sheet mills in 1904 as a doubler. Following various advances, in 1922 he was sent to the newly-acquired Armco plant in Ashland, Ky., and there built the first successful continuous sheet rolling mill.

Mr. Vigor joined the Armco organization in 1910 as a traffic clerk, and was general manager of traffic when he was appointed assistant general manager of the Ashland Division in 1928. He was appointed manager at Ashland in 1929. In 1941 Mr. Vigor went to Washington as a member of the Iron and Steel Section of the Office of Production Management. He recently returned to the staff of the Armco general management.



New Diamond Dressing Tool

The Koebel Diamond Tool Co., Detroit, Mich., announces a new diamond dressing tool which it is claimed fits most standard grinding machines. Known by the trade name of "Kodi," the new tool is said to do away with the necessity of a special dresser for each machine.

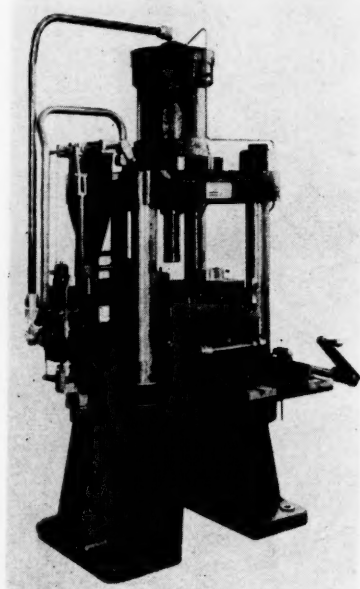
It comes supplied with a special shank or Ko-Adaptor, fitted with a recessed head set screw which locks the nib in position. Once installed, it remains on the machine; only the nib is removed for resetting or replacement.

Graduations are an additional feature of the tool. They are placed in a developed sequence to guide the operator. Longer wheel life and greater grinding efficiency are claimed to result from the fact that diamonds turned frequently insure constant sharp points.

New Hydraulic Press

(Shown below)

A new type of hydraulic press that has been built in 25, 75 and 100 ton sizes—that may be adapted to capacities up to 150 tons is announced and identified as a K Series by Hydraulic Machinery, Inc., Detroit, Michigan. Operated by separate motor driven power units, this type of press is manually controlled with a four-way valve—it automatically cuts off when the predetermined pressure or tonnage has been reached—lpm. of closing speed, power speed and opening speed as per specifications. The frame of the press is made up of heavy castings bolted together by steel tie rods with the power cylinder assembled vertically on the top and above a base platen 19" (right to left) x 13 1/4" (front to rear) on the 75 and 100 ton presses.



New A.C. Welder Line Announced



With a view to expanding its welding equipment service to war industries, Harnischfeger Corporation, Milwaukee, announces the addition of a complete line of Industrial A.C. arc welders to its present extensive line of P&H D.C. machines. Engineered and built for industrial service, these machines are being made in 7 Heavy Duty and 4 Intermittent Duty models with a range of capacities for handling production welding under continuous operation. The new line features the recently adopted "WSR" (Welding Service Range) ratings which show the actual minimum to maximum output of usable welding current. Specific "WSR" ratings of Heavy Duty models are: 50 to 270 amps., 60 to 375, 90 to 500, 100 to 625, 125 to 750, 150 to 900, and 200 to 1200—of Intermittent Duty Models: 20 to 185 amps, 20 to 235, 20 to 285, and 20 to 335. Setting and control of current throughout complete welding service range involves one simple, easy-to-operate adjustment. Improvements in the P&H control over other designs make it creep-proof.

Abrasive Engineer Joins Navy

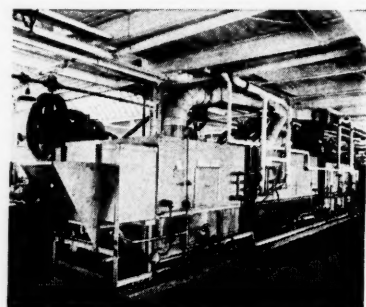
Lorin W. Grubbs, abrasive engineer for Norton Company, Worcester, Massachusetts, for the states of Virginia, North Carolina, South Carolina and part of West Virginia and Tennessee has been commissioned a Lieutenant (j.g.) in the United States Navy. Charles A. Babbitt, who has had experience in the Norton research laboratories and in field work, will take over Mr. Grubbs' territory.

New Pickling Machine Steps-Up Cleaning In Shell Production

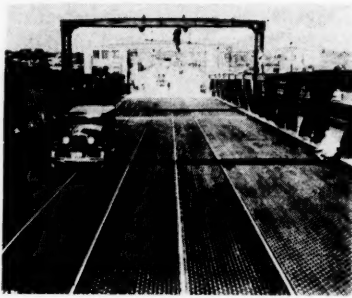
(Illustrated below)

Designed to meet the need for increased production of shells, a continuous, drum-type pickling machine has been developed for high-speed cleaning of shell cases, according to the Howard Engineering & Manufacturing Company, 1814 Freeman Avenue, Cincinnati, Ohio.

The machine is capable of pickling a maximum of 8,000, 37-mm. shell cases per hour. Parts to be cleaned travel through the machine in a drum which varies in diameter between sections, so that each section of the drum runs in its particular tank. Scale is removed from annealed parts by successive pickling, rinsing, neutralizing and rinsing operations.



Equipment



Open Mesh Bridge Decking

The photograph of open-mesh bridge decking accompanies an announcement of the tenth anniversary of the first installation of this type of bridge decking used in the City of Seattle, Washington.

City Engineer C. L. Wartelle, writing to Walter E. Irving, President of the Irving Subway Grating Co., Long Island City, describes the decking as "one of the revolutionary accomplishments in the history of bridge building. The non-skid surfacing has lived up to the highest hopes, and since its installation not one fatality or accident attributed to a roadway condition has been reported."

The decking is 80 per cent open and only 20 per cent steel. Maintenance costs are said to have been nominal. The City Engineer describes the open mesh as not only attractive, but highly effective in keeping roadways clear of ice and snow in winter. Rain cannot accumulate on the surface and this is important on local span bridges in the keeping of a constant dead load.

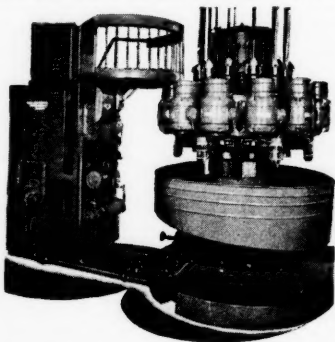
New York City is a large user of this type of surface for its bascule bridges, including the Marine Parkway Bridge over Jamaica Bay, said to be the longest highway vertical lift span in the world.

New Vertical Type 12-Spindle Automatic Screw Machine

(Shown below)

A new twelve-spindle vertical-type automatic bar feed and chucking screw machine hydraulically operated and known as the Eaglesfield Verti-Matic, is announced by the Machine Tools Division of The C. I. Togstad Company, Kokomo, Indiana.

Designed primarily for the fast and accurate production of parts from round, square or hexagon bar stock, the Verti-Matic may also be used for the machining of drawn steel parts of different shapes. Many adaptations are also possible. For instance: the machine can be used, with-



out changing, for chucking operations within its capacity, as the weight of the parts in the long magazine tubes automatically discharges the finished pieces.

Among the advantages claimed for the machine are faster production with less man power, simpler and faster set-up because of pre-tool set-up at the bench, and 50 per cent less floor space requirement because of the vertical construction.

Changes In Position of Ryerson Officials

Wayne D. Dukette has been appointed Manager of the Railroad Sales Department of Joseph T. Ryerson and Son, Inc., succeeding J. P. Moses, who has held this position for many years.

Although Mr. Moses is retiring from the management of this department at his own request, he will continue in the Railroad Sales organization in an advisory capacity.

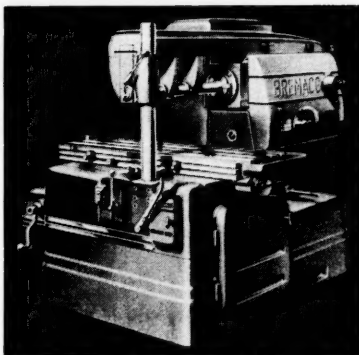
Roland W. Burt, Manager of Eastern Railroad Sales, located at the Jersey City Plant, will continue in this position.

Mr. Dukette has been associated with the Ryerson Company for 29 years—for the last 7 years as the Assistant Sales Manager of the Ryerson Chicago Steel Service Plant.

Manufacturers Representative Available

William J. Haller, 512 N. Eutaw Street, Baltimore, Maryland, who has been a Manufacturers' Representative for eight years, is available for a few new lines. He is acquainted with the hardware, mine, mill and contractor supply trade, besides marine jobbers, in the states of Delaware, Maryland, District of Columbia and Virginia.

New Down Cut Milling Machine With Twin Lead Screws



Production of a Model #4 Milling Machine with Twin Lead Screws capable of down cut milling (same direction as the feed) on a precision, high speed production basis, is announced by the Bremace Corporation, Detroit, Michigan.

The Bremace Machine uses two unsplined lead screws that are so connected in relation to each other that the effective bearing surface, or attack area, with the feed nut, is constantly in tension through the use of a (patent pending) synchronizer sleeve (Back-Lash-Eliminator) conventionally arranged outside the gear housing in the table. Axial play in the thread shoulders of the lead screws is in this way entirely avoided, whether the table moves with or against the cutter in heavy feed or rapid traverse. A housing cast integral with the table, which carries all of the thrust loads, contributes to the sturdiness of this assembly. For further details address the maker.

Asbestos-Cement Sheathing Answer to Metal Locker Shortage

The Philip Carey Mfg. Company, Cincinnati, announces that highly efficient lockers are now being made with Carey-stone (Asbestos-Cement) Flat Sheathing. Produced by combining Portland cement and asbestos fibres under tremendous pressure, the resultant material is a stone-like substance impervious to rust, rot or corrosion, and is fire and rodent proof.

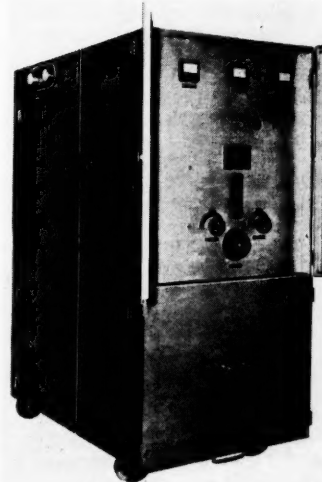
Plant carpenters can easily make lockers from such sheathing.

Further details are available upon application to the manufacturer.

New Method of Heating Non-Metallic Substances

(Pictured below)

Almost any non-metallic material—gas, liquid or solid—it is claimed can be heated uniformly throughout and in minutes where ordinarily it requires hours, with the new Thermex High-Frequency Heating Equipment. Heating is accomplished within the particle itself by reason of its molecular resistance to the high voltage (5,000 to 15,000), high-frequency (1,000,000 to 10,000,000) current passed through it from flat electrode plates covering opposite sides or top and bottom of the mass to be heated. All coils, tubes, controls, etc., are housed within a compact safety cabinet connected by cables to the electrodes. Any average-good workman can be trained to operate. Equipment it is said is extremely efficient in its transformation of electric current energy into heat energy, improves quality of product, increases production, simplifies auxiliary equipment and saves floor space. Already established in the wood-fabricating field it is used for the processing of plywoods and laminated woods used in airplane and ship construction. Other successful applications, in installations and laboratory are announced in cellulose, paper, textiles, ceramics, tobaccos, plastics, and a variety of fields. The Girdler Corporation, Thermex Division, Louisville, Ky., are the manufacturers.



Baltimore and Ohio Report

The annual report for 1942 of the Baltimore and Ohio Railroad Company shows a marked growth in operating revenues, and an increase in net income of \$24,231,000 over 1941. Railway operating revenue increased from \$227,503,000 in the year before to \$306,254,000 last year. This was an increase of \$78,751,000, while railway operating expenses increased \$43,322,000.

It is interesting to note that among the items of new equipment placed in service there were 687 new steel freight-train cars acquired, besides three multiple-unit Diesel electric freight locomotives. Fifty caboose cars were constructed at the company's shops.

While orders were placed early last year for delivery of 1,000 hopper cars, each of 50-tons capacity, War Production Board restrictions did not permit their full acquisition, but the company is permitted to acquire 525 composite hopper cars which are expected to be received some time this year.

The purchase of three multiple-unit Diesel freight locomotives and 25 Diesel switching locomotives has been authorized. A number of these probably will be delivered during 1943. Orders were also placed for 20 heavy freight locomotives scheduled for delivery in the latter part of this year.

Railway tax accruals increased 58.77 per cent, reaching a total of \$25,054,000 as compared to \$9,273,000 in 1941. Taxes for the year absorbed 24.56 cents out of each dollar of net operating revenue. This is equivalent to \$4 per share on the company's preferred stock, and \$8.85 per share on the common stock outstanding. Nearly \$7,000,000 was for state and local taxes.

Atlantic Coast Line Annual Report

The annual report of the Atlantic Coast Line Railroad Co. for the year 1942 is a record of continued progress by this important carrier. Operating revenues increased from \$67,404,000 in 1941 to \$115,108,000 in 1942.

Net operating revenues increased from \$20,544,000 in the first named year to \$52,161,000 last year. With railway tax accruals nearly four times what they were in 1941, reaching the total of almost \$28,000,000, the net income after the deduction of fixed charges and other charges stands at \$22,619,000 which is more than double the figures of the year before.

Expenditures for maintenance of equipment were \$16,527,000, and for maintenance of way and structures \$8,085,000. Total increase in operating expenses is 34 per cent, while railway tax accruals increased 264.71 per cent. A debt reduction of more than \$14,000,000 was carried out.

Space will not permit giving in detail all of the interesting figures which the report sets forth, but altogether it affords encouraging information not

(Continued next page, column 3)

Business News

New Packages For Flake Graphite



The Joseph Dixon Crucible Co., Jersey City, N. J., with a view to improving the packaging of dry lubricating flake graphites, are placing on the market new packages which are said to be outstanding examples of modern informative labeling.

Dry lubricating graphite, one of the Dixon products, will appear in a new container with lithographed decoration picturing various uses of the product made from actual photographs. Attached to the package will be a booklet explaining in a practical way numerous important applications of graphite in addition to giving other helpful directions for using the material in combination with other ingredients.

Plank Flooring for Heavy Duty Factory Floors

Developed for manufacturing plants, loading platforms, freight houses, storage plants, in fact any plant that requires resurfacing of old worn out concrete and wooden floors, this Asphalt Plank Flooring, it is claimed, is resistant to acids, oils and gasoline, as well as being noiseless under trucking wheels, resilient, waterproof and durable.

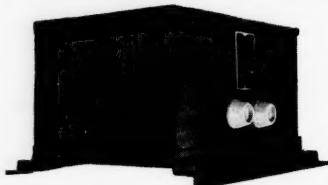
The flooring material arrives on the job for immediate installation in convenient sized planks of required widths, lengths and thicknesses.

The manufacturer is the Serviced Products Corporation, 6051 W. 65th St., Chicago. Descriptive literature is available upon request.

New Cold Cathode Lighting Transformer

(Pictured below)

A new style Cold Cathode Lighting transformer especially designed for industrial applications is announced by Acme Electric & Manufacturing Company of Cuba, N. Y. Capacity of 120 milliamperes in 3000, 4000, 6000, 9000, 12000, or 15000 volt secondaries. A heavy duty, vibration proof unit, with standard conduit box for primary connection and built-in parallel electrode housings for direct connection of cold cathode tubes. The manufacturer particularly emphasizes the fact, that in addition to the savings in critical materials, the "lamp life" of cold cathode tubes makes for inexpensive maintenance. Installations under test are said to have shown continuous operation of 20,000 hours and more without appreciable loss in light output or replacements of tubes.



Climax Engineering Interests Buy McAlear Manufacturing Company

Ownership of McAlear Manufacturing Company, Chicago producer of valves, regulating and control equipment, was acquired by the interests controlling Climax Engineering Company, Clinton, Iowa, manufacturer of internal combustion engines, power units and generating sets.

Edward F. Deacon, Climax president, also will be president and general manager of the McAlear Company. Both companies are now subsidiaries of General Finance Corp. Mrs. P. G. McAlear, formerly president and now chairman of the board of the McAlear Company, will continue to be actively identified with the management.

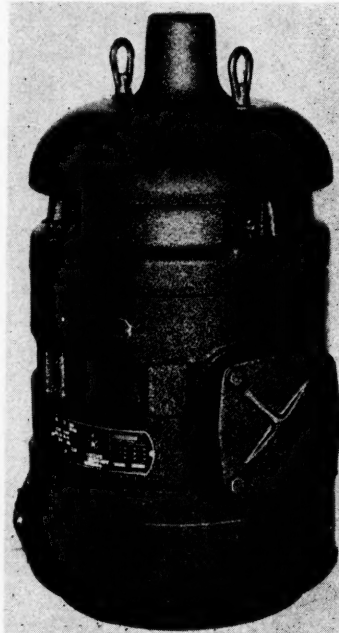
Wants To Represent Manufacturers

A company handling building specialties and industrial materials is sales agent in St. Louis calling on industrial firms. It announces its desire to represent manufacturers of industrial materials and equipment. Address No. 9500, care Mrs. Record.

Industrial Engineers Expand

Smith, Hinchman and Grylls, Inc., are industrial engineers in the Penobscot Building, Detroit. They announce an expansion of their Tool Engineering division and say they have made provision for engineering staff increases varying with the requirements of specialized projects which they handle. The message is addressed particularly to war producers and engineers.

New Vertical Hollow Shaft Explosion Proof Motors



A new line of vertical hollow shaft explosion proof motors is now offered by Fairbanks, Morse & Co. for operation in Underwriters' Class I Group D hazardous gas locations. These motors are designed primarily for pumps handling large quantities of volatile materials such as high octane aviation gasoline.

Special equipment is required for the efficient handling of gasoline in fueling planes at air fields, as well as for transferring gasoline from tankers to storage locations. Fairbanks-Morse horizontal and vertical explosion proof motors are designed to minimize the hazards arising from such operations.

Equipment

Ball Bearing Tail Rope Sheaves



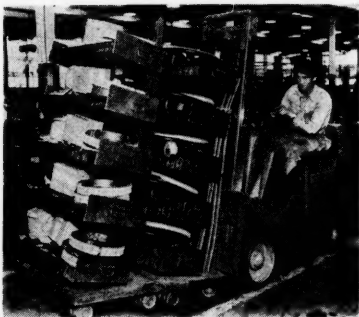
A special ball bearing sheave to withstand scraping which is frequent on tail rope sheaves, has been developed by the Sullivan Machinery Co., Michigan City, Ind. All side covers and sheave wheels are tough alloy steel. Hooks, eyebolts and clevises are forged from alloy steel. An extra wide sheave wheel reduces rope wear. Openings are large enough to pass a square knot of rope. Quick opening snatch block construction gives fast, easy rope change. Greasing is required but once a year.

Lift Truck and Rack System Solve Special Handling Problems

(Shown below)

To effect economies inherent in moving large unit loads far and fast, manufacturers whose operations involve intradepartment hauling, temporary storage and precise production-positioning of comparatively small multi-unit assortments of materials in a wide variety of sizes, shapes and types are utilizing special racks and lift trucks manufactured by Towmotor Corporation, Cleveland, Ohio.

Racks are readily removable and can be adjusted on standards to accommodate many different types of loads. Two fully-loaded racks can be picked up and carried by a standard fork lift truck, rapidly moved through the plant and spotted for temporary storage. Caster-equipment racks permit exact positioning at work stations.



Chemical Exposition

The 19th Exposition of Chemical Industries will take place during the week of December 6-11, 1943, at Madison Square Garden, New York. The change from the Grand Central Palace, where previous exhibits have been held, is due to the fact that the U. S. Army has commandeered the Palace as an induction center.

All exhibition space will be on one floor at the Garden, but the space available will be only approximately one-half of the 1941 Exposition which was held at the Grand Central Palace.

A diagram of floor plans can be had from the International Exposition Company, 480 Lexington Avenue, New York City.

Harman to Head Sellers Company

William H. Harman has been elected President of William Sellers & Company, Incorporated, Philadelphia, builders of machine tools, special machinery and locomotive injectors since 1848.

Mr. Harman has been associated with The Baldwin Locomotive Works since 1928 and during the last five years served as Vice President in Charge of Sales. From 1915 to 1928 he was President of the Southwark Foundry & Machine Company, now a Division of Baldwin.

Mr. Harman will remain a Director of The Baldwin Locomotive Works. He is President of the Diesel Engine Manufacturers' Association, and a member of the American Society of Mechanical Engineers.

New Electronic Meter Measures Short Time Intervals



A new electronic time-interval meter for accurately measuring extremely short intervals—as low as 100 microseconds—has been announced by the Special Products section of the General Electric Company. Specifically, the meter is designed for measuring the time interval between two events which can be converted into electrical impulses, such as the elapsed time between the closing of two controls; between two impulses to a phototube; and between an electrical impulse and a light impulse.

Consisting of two units—an electronic panel and a phototube with its preamplifier stage—the meter has eight ranges, selected by means of a tap switch so that any time interval of a length between .0001 second and 3 seconds can be measured. A standard indicating instrument calibrated in milliseconds gives a direct reading of the time interval measured.

Operating from a 115-volt, 60-cycle lighting circuit, the meter is stabilized so that normal line-voltage variations do not affect its accuracy, which is two per cent of full scale value, or one scale division. The meter will continue to indicate the time interval after measuring, with a drift of less than one division per minute. When another reading is required, a push button immediately clears the dial.

Atlantic Coast Line Report

(Continued from page 40, column 1)

only to the road's stockholders, but to everyone interested in Southern progress and the important part which the railroads occupy in its development.

Chattanooga Manufacturers' Meeting

The Chattanooga Manufacturers' Association had a memorable and enthusiastic gathering at their Spring Meeting with about one hundred and fifty executive heads of Chattanooga's principal manufacturing concerns present.

William P. Witherow, President of Blaw-Knox Company of Pittsburgh, was the principal speaker. He was introduced by E. J. McMillan of the Standard Knitting Mills of Knoxville.

Clarence Avery of the Chattanooga Glass Company and President of the Chattanooga Manufacturers' Association, presided.

Mr. Witherow spoke on the subject "Jobs-Freedom-Opportunity" with particular reference to post war conditions. His talk radiated confidence in industry's ability to provide employment for all, providing it is given the conditions necessary to its preservation and development. He said no man or woman of the fifty-five million now employed on the home front or the nine and one-half million in the Armed Forces need worry about a job if our Government will do three things.

(1) Make tax laws that will permit corporations to set aside reserves for post war expansion and development.

(2) Create confidence in its citizens that will make them feel certain that their money placed in investments will not be jeopardized by Government antagonism and Government competition in business.

(3) Preserve free and open markets in which borrower and lender may get together under mutually beneficial conditions.

By "winning the peace," he said, Americans mean the end of defeatism, of the doctrine of restriction, scarcity and dependency. They mean an early end to war time controls and regimentation, an end to the philosophy which would drain a man of his initiative, his chance to build and get ahead, which would put a man's life, his living and his work on a disaster basis—a dole basis.

President Avery appointed the following Committee on Post War Planning:

Burton Frierson, Jr., Vice President, Dixie Mercantile Co.; O. J. Heyer, Vice President and General Manager, Chattanooga Stamping & Enameling Co.; A. J. Moses, Vice President and General Manager, Combustion Engineering Co.; Warren Jeffords, Vice President and Treasurer, American Lava Corporation; L. H. Caldwell, President and Treasurer, Tennessee Stove Works. *Ex-Officio* C. R. Avery, President and General Manager, Chattanooga Glass Co.; E. C. Patterson, President, Treasurer and General Manager, Chattanooga Boiler & Tank Co.

Southern Contracts Higher in May—

*industrial
awards also
rise above
April total*

By

SAMUEL A. LAUVER
News Editor

SOUTHERN construction took an upward swing in May. The \$144,961,000 total stood out as the second highest for the year so far and represented a twenty-five per cent increase over the preceding month, although compared with the fifth month of the previous year it was down sixty-six per cent.

The higher May figure was due primarily to a substantial increase in industrial construction contracts, this despite the War Production Board announcement that the Nation's industrial energies would be concentrated on utilization of existing facilities rather than erection of new plants or expansion of others.

Effect of the W. P. B. order is expected later, but the exigencies of war respect no man-made decisions. Shortages and emergencies may compel authorities, who in some instances seem to disdain coordination of action, to embark on new construction, either industrial, military or for civilian benefit, that was far over the horizon at the time the decision was made.

Industrial awards, as tabulated from reports published in the CONSTRUCTION BULLETIN, totaled \$24,489,000 in marked contrast with the low total established for this type of building in April. The figure for the latter month was \$4,046,000. At no time in recent years had industrial awards ebbed to the April level.

Private building rose encouragingly in May. The total was \$4,363,000 compared with April's \$2,841,000. As was expected, the entire total was made up principally of housing construction. Practically all other types of private work have slowed

South's Construction by Types

	May, 1943 Contracts Awarded	Contracts to be Awarded	Contracts Awarded First Five Months 1943	Contracts Awarded First Five Months 1942
PRIVATE BUILDING				
Assembly (Churches, Theatres, Auditoriums, Fraternal)	\$98,000	\$443,000	\$627,000	\$3,228,000
Commercial (Stores, Restaurants, Filling Stations, Garages)	126,000	70,000	449,000	3,360,000
Residential (Apartments, Hotels, Dwellings)	4,139,000	5,905,000	21,020,000	67,433,000
Office	20,000	947,000
	\$4,363,000	\$6,418,000	\$22,116,000	\$74,968,000
INDUSTRIAL	\$24,489,000	\$18,172,000	\$132,143,000	\$572,560,000
PUBLIC BUILDING				
City, County, State, Federal	\$48,260,000	\$29,028,000	\$230,847,000	\$773,108,000
Housing	18,187,000	29,702,000	114,214,000	114,390,000
Schools	2,089,000	4,391,000	6,844,000	18,349,000
	\$68,536,000	\$63,121,000	\$351,905,000	\$905,847,000
ENGINEERING				
Dams, Drainage, Earthworks, Airports	\$30,571,000	\$15,127,000	\$131,462,000	\$195,014,000
Federal, County, Municipal Electric	1,825,000	10,000,000	3,702,000	12,428,000
Sewers and Waterworks	4,815,000	4,308,000	18,197,000	35,644,000
	\$37,211,000	\$29,435,000	\$153,361,000	\$243,086,000
ROADS, STREETS AND BRIDGES ..	\$10,362,000	\$7,833,000	\$49,452,000	\$71,522,000
TOTAL	\$144,961,000	\$122,979,000	\$708,977,000	\$1,867,983,000

almost to the vanishing point. The small part of the total, other than residential, was for assembly structures and commercial establishments.

Both public building and public engineering work were up in May. The \$68,536,000 for public building, which was comprised mostly of public building and public housing, was about nine per cent higher than the April figure. Public engineering was about ten per cent higher. Much of the work represents airport construction. Road contracts dropped during May. The total for the month was \$10,362,000.

The total for the five elapsed months of 1943 is \$708,977,000. Although less than one-half the accumulation of Southern construction awards in the comparable period of 1942, the current five month total is only about eight per cent below the value of contracts in the first five months of 1941 and is far beyond the totals for similar periods prior to that time.

All building, with exception of a negligible amount of private work, can now be considered government construction, in view of the fact that most of the

industrial expansions or new plants are financed in some way by Federal funds. Even the private work with its preponderance of residential projects is in some instances guaranteed by a Federal agency.

Statistics on the make-up of the present construction picture show that ninety-seven per cent of it is government controlled, including the nineteen per cent generally referred to as industrial construction. Fifty per cent of the total is for public building. Twenty-one per cent can be classed as public engineering. The balance, or seven per cent is represented by awards for highways and bridges.

Actual figures, as revealed by compilations of Southern projects reported to the *Manufacturers Record* construction bulletin in the first five months of this year, show the public building valuation to be \$351,905,000; public engineering to stand at \$153,361,000; industrial projects, at \$132,143,000. The balance of the total is the \$49,452,000 for roads and bridges, and the \$22,116,000 for private building.

A study of the figures by states shows Texas to head the list with a five month total of \$201,783,000. Florida ranks second. (Continued on page 58)

South's Construction by States

	May, 1943 Contracts Awarded	Contracts to be Awarded	Contracts Awarded First Five Months 1943	Contracts Awarded First Five Months 1942
Alabama	\$2,998,000	\$4,064,000	\$22,523,000	\$69,047,000
Arkansas	3,888,000	1,115,000	25,483,000	24,364,000
Dist. of Col.	4,577,000	1,162,000	8,129,000	33,954,000
Florida	18,616,000	6,918,000	93,073,000	107,920,000
Georgia	11,394,000	10,065,000	59,519,000	83,847,000
Kentucky	3,793,000	3,228,000	17,624,000	81,662,000
Louisiana	6,859,000	5,026,000	21,974,000	124,650,000
Maryland	9,929,000	9,295,000	54,779,000	120,858,000
Mississippi	4,944,000	8,281,000	20,463,000	87,539,000
Missouri	2,644,000	1,411,000	12,367,000	25,193,000
N. Carolina	4,621,000	5,492,000	22,156,000	110,773,000
Oklahoma	29,761,000	22,632,000	44,664,000	165,488,000
S. Carolina	3,756,000	1,046,000	24,342,000	37,928,000
Tennessee	3,384,000	2,419,000	36,354,000	124,542,000
Texas	23,517,000	31,226,000	201,783,000	521,600,000
Virginia	10,074,000	9,389,000	45,523,000	177,477,000
W. Virginia	204,000	278,000	6,821,000	31,141,000
TOTAL	\$144,961,000	\$122,979,000	\$708,977,000	\$1,867,983,000

WANTED—CONTRACTORS, and SUB-CONTRACTORS

The products, equipment and services listed below are urgently needed for the war program. Information, blue-prints and specifications may be obtained from the Philadelphia or Baltimore offices of the War Production Board. The reference symbol should be quoted in your request.

Ref. Buescher-18-3

A Penna. corp. requires facilities for machining: 24 sizes, 1,000 of each—STAINLESS TAPER PINS FOR DETACHABLE LINKS. Material: Type 416 Steel (Carpenter free machine or equivalent). Dimensions vary from 1 1/16" to 1 3/8". Small end from .208" to 1.250". Taper 1/8" per foot or .0208" per 1" length.

Ref. Buescher-21-1

A Penna. concern requires 3,258 GLANDS, 3 types. Dimensions: O. D. 1 1/4" to 1 3/4"; length 3/4" to 1". Equipment required: Automatic screw or hand screw machine. 1 1/4" to 1 3/4" spindle. Tolerance: plus or minus .003". Material—B-1112 or X1112 steel. Material will be furnished.

Ref. Buescher-21-2

A Penna. concern requires 3,258 DISC NUTS, 4 types. Dimensions: O. D. 1 1/4" to 2 1/4"; length 3/4" to 1 1/4". Equipment required—Automatic screw or hand screw machine, spindle 1 1/4" to 2 1/4". Tolerance: plus or minus .003". Material—303 Stainless Steel. Material will be furnished.

Ref. Buescher-21-3

A Penna. concern requires forging facilities on 16,000 LOCOMOTIVE CONNECTING RODS. Equipment required: 12,000 to 16,000 lb. Drop Forge Hammers. Deliveries: 200 to 300 pieces per month starting November, 1943. Overall dimensions: 43" long, 13" wide, 5" thick. Weight: 195 lb. each. Material: 4140 Steel, allocated C.M.P., Priority AAI. Dies not furnished.

Ref. Buescher-21-4

A Penna. concern requires 3,258 VALVE STEMS, 12 types. Dimensions: length 8 1/4" to 15 1/2"; diameter 1 1/4" to 1 3/4", threads 5 R.H. or 6 R.H. std. Acme threads per inch. Equipment required: Turret lathe 1 1/2" spindle, No. 1 milling machine. Tolerance: No. 3 thread fit, turned diameters plus or minus .003". Material: 303 free machining stainless steel. Material will be furnished.

Ref. Buescher-21-5

A Penna. concern requires DIES FOR DROP FORGINGS LOCOMOTIVE CONNECTING RODS. Material: 4140 Steel.

Dimensions: 43" long, 13" wide, 5" thick. Weight: 195 lbs. Priority AAI.

Ref. Buescher-21-6

A Penna. concern requires 3,258 GLAND NUTS, 3 types. Dimensions: 2" to 2 9/16" Hex Stock. Width: 1 1/4" to 1 7/16". Threads 1 1/4" to 2", 12 N. C. 3. Equipment required: automatic screw or hand screw machine. Tolerance: plus or minus .003". Material: S.A.E.—B1111 or 1112 steel. Will be furnished.

Ref. Buescher-18-2

A Penna. concern requires facilities to machine RAM ASSEMBLY for Steering Gear. Requirements: first forging available by August 1, then one every two months until completion. Equipment required: Planer 18' x 4' bed, 38" under head; engine lathe 18' between centers to swing 44"; Hydraulic slotter 30" stroke; horizontal boring mill 3" bar, 30" table travel. Material: Steel forgings, Navy Specifications 4684 INT, to be furnished by prime contractor. Overall dimensions: 17 8/8" x 2 4/4" x 3 2/2".

Ref. Buescher-18-1

A Penna. concern requires facilities for Taper Boring Hub and cutting Keyway in eight RUDDER CROSSHEADS for Steering Gear. Requirements: first forging available by August 1, then one every two months until completion. Equipment required: 12 ft. Boring Mill, 2 9/8" bar travel, hydraulic slotter—32 1/4" stroke. Material: Steel Forgings, Navy Specifications 4982, class AN, furnished by prime contractor. Tolerance: Taper bore .003", keyway .001". Overall dimensions: 4 8/8" wide x 2 9/8" deep 10" length.

Ref. Buescher-19-6

A Government Agency requires 725 OIL PUMP IDLER GEARS for Diesel Engines. Delivery required: 90 days after date of contract. Dimensions: O. D. 1.795" x 2.3/16" width. 16 teeth special form. 10 pitch, 1.600" P. D. 25 degree pressure angle. Material: S.A.E. 3135 steel, heat treat scleroscope 33 to 38.

Ref. Buescher-19-7

A Government Agency requires 1750 OIL PUMP IDLER GEARS for Diesel Engines. Delivery required: 90 days after date of contract. Dimensions: O. D. 1.795" x 1.312". 16 teeth, special form 10 pitch, 1.600 P. D. 25 degree pressure angle. Material: S.A.E. 3135 steel, heat treat to scleroscope 33 to 38. Prints can be seen at Philadelphia office.

Ref. Buescher-19-12

A Government Agency requires 900 OIL PUMP GEARS (600 Drivers and 300 Driven gears). Delivery 90 days after date of contract. Driver Dimensions: O. D. 1.795" x 2.5/16". Driven Dimensions: O. D. 1.795" x 1.439". 16 teeth, 10 pitch, 1.600" — .001" P. D. special form, 25 degree pressure angle. Material: S.A.E. 3135 CH. NI. Steel, Scleroscope 33-38.

Ref. Buescher-19-4

A Government Agency requires 1950 FLY-WHEEL GEARS for Diesel Engines. Delivery required: 90 days after date of contract. Dimensions: 18.680" O. D. x 11/16" width; Bore 17.481" — .004", 148 teeth, 8-10 pitch. .196" — .192" tooth thickness, involute form of tooth, 20 degree pressure angle. Pitch circle eccentricity .0025". Material: S.A.E. 1050 O. H. Forged Steel, heat treated to give scleroscope hardness to 45 to 60.

Ref. Buescher-19-5

A Government Agency requires 550 FUEL PUMP DRIVE GEARS for Diesel Engines. Delivery: 90 days after date of contract. (Continued on page 52)

Chemistry and Its Part in the Petroleum Industry

Gasoline contains certain materials invaluable for anti-knock purposes which tend to form a sticky gum. E. I. duPont de Nemours and Company, in calling attention to this fact, announces the following as some of chemistry's contributions to the petroleum industry:

"Less than one-half an ounce of a chemical per hundred gallons of gasoline—a few thousandths of one per cent—makes it possible to ship and store this fuel all over the world without its quickly forming gum which would clog up the motors and fuel lines of airplanes, tanks and trucks.

"Costly processes were previously used to remove these harmful ingredients, but they also reduced the anti-knock value of the fuel. Now very small quantities of a chemical gum inhibitor stabilize gasoline for long periods without adversely affecting its quality.

"Chemicals are even used in locating oil deposits. In the process known as seismic prospecting, an explosive is buried in the earth in the locality where the presence of oil is suspected. Its detonation sets up vibrations, some of which go downward until they strike a geological formation which reflects them back to the surface, just as light is reflected by a mirror. Delicate instruments pick up and record the explosive waves, and from the recordings trained scientists can readily locate geological formations favorable to the presence of petroleum.

"To start oil flowing from a well in hard, dense formations usually necessitates a shot of nitroglycerin or some other explosive.

"Once crude petroleum is obtained, many chemicals are required for refining it. For example, acids in the crude which corrode stills are neutralized by adding small amounts of ammonia. Sulfuric acid is another refining agent, reacting with petroleum to remove harmful ingredients. Nitrobenzene, sulphur dioxide, phenol, furfural and cresylic acid are used as selective solvents in the refining of lubricating oils."

It is pointed out chemicals play important roles in the production of high octane gasoline; in certain lubricating oils to make the oil film tough, and to prevent corrosion by some lubricants.

The petroleum industry's chemical requirements are numerous and varied.

New Plastic From Cotton

A new plastic made from cotton by the Hercules Powder Company is said to be filling an important role in the production of American bombers and fighting planes.

Ethyl cellulose is made from cotton and alcohol, and the advantages claimed for it by the manufacturer are that it can withstand the lowest freezing temperatures of any plastic, or it can be formulated to withstand temperatures as high as 175 degrees F.

In the cold of the sub-zero stratosphere it is used to insulate wires, and a further use for the product is found in the manufacture of aluminum parts for airplanes. The output of the company has been expanded to meet war needs.

Rubber as Electrical Conductor

Rubber which acts as a conductor of electricity rather than as an insulating material is being used in a new-type large size electrical cable developed by American Steel & Wire Company, U. S. Steel subsidiary. A major contribution to America's war effort is effected by use of the semi-conducting rubber, which permits transmission of higher voltages for operation of X-ray machines and heavy industrial equipment.

High voltage cables have along their entire length some slight discharge of electrical energy. This electrical discharge comprises ionization of small amounts of air which may be present and electrical sparks or arcs, all of which are highly injurious to rubber insulation. Even in the case of heavily insulated high voltage cable the discharge can occur around the outer surface of the insulation and attack the insulation from the outside, eventually causing it to crack, fail and become useless. The only answer to this problem is to carry off so-called "charging" or static electricity as rapidly as it comes from the conductor. This procedure is known as shielding.

One method of shielding has been to apply several strands of metal over the insulation, running the length of the cable. Under favorable conditions a metallic shield of this type is satisfactory, but if the cable is bent and subsequently straightened, or when it expands and contracts with alternate heating and cooling in service, the metal shield tends to separate slightly from the surface of the insulation, forming gaps at intervals throughout its length. To overcome this difficulty the American Steel & Wire Company developed a semi-conducting rubber which can be placed between such metallic shields and the insulation to carry off and dissipate the discharge from the conductor before any damage to the insulation can take place.

Like many major developments in the fields of science, the remedy required years of painstaking research. But the answer, when found, was relatively simple. Rubber is a hydro-carbon, composed of hydrogen and carbon in chemical combination. Additional carbon is often compounded with rubber to increase its mechanical strength and toughness, especially in compounds that are to be used for the jackets of portable cables. Pure carbon is a fairly good conductor of electricity, but when combined with other substances, it usually acts as an insulator. After much study and experimentation a carbon of the proper type was found and a method of introducing it into the compound was developed. The resultant product gave some degree of conductivity without sacrifice of typical rubber-like physical properties. Compared with any familiar rubber insulating compound, the new product is a good conductor; compared with copper, its resistance is still very high.

New Industrial Plants, Expansions in the South During May

Proposed Stage

ALABAMA

BESSEMER — plant — Engineers of Reynolds Metal Company, and War Production Board and Defense Plant Corporation engineers will inspect buildings at Bessemer for establishment of \$20,000,000 extrusion, or fabricating plant.

ARKANSAS

EUREKA SPRINGS — top plant — H. P. Webb and Associates of Branson, Mo., installed machinery in a building near the Missouri and Arkansas Railway Station for the manufacture of toys and novelties; operate lumber plant at Branson where novelties are manufactured from walnut shells, etc.

FLORIDA

Canal — House Rivers and Harbors Committee approved a bill providing for \$112,000 in federal improvements to the 5-mile Gulf County canal in Florida, extending from pipeline terminus at Port St. Joe to Inland Waterway five miles eastward.

MIAMI — freight warehouse — Florida East Coast Railway Co., care of Chief Engineer, St. Augustine, plans freight warehouse; 1-story; conc. block; C. G. Henninger, Archt., F. E. C. Railway Bldg., St. Augustine; preliminary estimate prepared by Gunn & Goll, Inc., 69 N. E. 36th St., Miami.

LOUISIANA

Oil line — Standard Oil Co. of Louisiana, Shreveport, applied for War Department permit to install an 8-in. oil pipe line, across the channel section, across Bayou Lafourche.

ERATH — office building — Texas Co. of New Orleans plans office building and additional housing in connection with oil recycling plant; may call for bids in about 3 months.

MARYLAND

BALTIMORE — Canteen, etc. — Pennsylvania Railroad, R. C. Morse, vice president of Eastern region, will build new canteen and lounge as an annex to its station; expand station's ticket service, baggage facilities and telephone lines; servicemen lounge will adjoin the present building on the east or St. Paul Street side in the area of the main driveway level; ticket-selling and baggage facilities on the main floor of the station will be enlarged and remodeled; telephone lines serving the ticket office and the information and reservation bureaus will be doubled, public telephone and telegraph facilities, with the barber shop and boothblack stand, will be relocated and modernized; Raymond Loewy, 580 Fifth Avenue, New York, N. Y., Architect.

HAGERSTOWN — plant — Central Chemical Co., will rebuild burned fertilizer plant; work to begin soon.

MISSISSIPPI

PICAYUNE — tung oil mill — L. O. Crosby & Sons, plans rebuilding burned tung oil mill.

PICAYUNE — tung crushing plant — Goodyear Yellow Pine Co., and associated industries plan rebuilding burned tung crushing plant.

MISSOURI

CARTHAGE — plant — The Gray Manufacturing, Lamar, leased portion of building to replace burned plant at Lamar.

KANSAS CITY — Kansas City Southern Railway Co., Kansas City, Mo., stockholders approved proposal to acquire properties of two subsidiaries, Texarkana & Fort

Smith Railway and Kansas City and Grand View Railway Co.; two companies will be dissolved and parent company will assume obligation of \$10 million Texarkana first mortgage 5½% bonds; \$1,500,000 Texarkana Union Station 5% trust certificates and \$3,000,000 Kansas City and Grand View Railway first mortgage 4½%.

KANSAS CITY — foundry — Witte Engine Works, Edward H. Witte, Pres., 1600 Oakland Ave., acquired property between Oakland and Richmond Aves. and 16th St. and 16th St. Terrace, for construction of \$100,000 foundry, also erect shipping and packing room on west side of present plant.

LAMAR — plant — Lamar Lumber Co., plans rebuilding burned lumber yard.

ST. LOUIS — warehouse — Laclede-Christy Clay Products Co., 1711 Ambassador Building, starting work on the construction of a warehouse, 4714 S. Kingshighway; brick and steel, 2 stories; reinforced concrete foundation, built up roofing; \$15,000; E. H. Krauthelm, Chief Engineer, for owner, 5900 Manchester, Architect.

ST. LOUIS — warehouse — St. Louis Car Co., 8000 N. Broadway, erect warehouse, 8000 N. Broadway; C. D. Clawson, Company Engineer; owner builds.

NORTH CAROLINA

Railroad — United States Government, has allocated \$400,000 for improvement to the 93-mile Atlantic and East Carolina Railroad, which runs between Goldsboro and Morehead City; this fund will make possible the rebuilding of the line to care for heavier loads and to speed the operation of trains; line is the principal rail feeder for Marine Base at Cherry Point; fund was made available after the last legislature provided \$200,000 for clearing up bond deficiencies of the line.

BURLINGTON — canning plant — Agriculture Committee of Chamber of Commerce, H. E. Brewer, Chrmn., interested in establishment of cannery; types and costs submitted by Consolidated Can Co.; B. V. May of May-McEwen-Kaiser Co., also interested in the project.

CHADBOURN — dehydration plant — Lacy Tate and associates let contract for automatic dehydration plant; cost \$50,000.

CHARLOTTE — plant — United Aero Service, Inc., organized with E. F. Howington of Atlanta, Ga., president; parent company of new organization is General Discount Co. of Atlanta, Ga.; new company will take over sites and buildings of Foley plant on Lawyers Rd.; plans expansion program of \$500,000.

ROXBORO — buildings — Roxboro Lumber Co., will rebuild burned office and 2 lumber sheds.

OKLAHOMA

Pipe line — Cities Service Co., W. Alton Jones, Pres., 60 Wall St., New York City, plans 200 mile natural gas pipe line between Guymon and Blackwell, Okla., to bring to Kansas City, gas from vast Hugoton field, extending south from Garden City, Kans. into Oklahoma; work to be started within 30 days of formal approval of War Production Board and Federal Fuel Administration; estimated cost \$15,000,000.

SOUTH CAROLINA

LAURENS — addition — Daniel Construction Co., Greenville, has contract for additional buildings for Laurens Glass Works; cost \$125,000.

TENNESSEE

Rail line — Emory River Railroad Co., chartered with \$250,000 capital, by Joseph A. McAfee, B. T. Bartlee and C. B. Tate; charter obtained at Nashville; applied to Interstate Commerce Commission, Nash-

ville, for authority to construct and operate 15 miles of railroad from Lancing to Gobey, thence to the Dean Coal seam.

KNOXVILLE — repair shop — Quality Body Works, Earl Thompson, V. P., contemplates \$40,000 repairs to auto repair shop.

TEXAS

COLUMBUS — tumbling mill — Southern Products & Silica Co., Lilesville, N. C., moving plant to Columbus; install large tumbling mill to process flint rock used in grinding mills for ceramics, paints, etc.

ENNIS — pickle factory — Sol Ackerman of Dallas, owner of Wonder Products, acquired building will enlarge and operate pickle plant.

FORT WORTH — laboratory — Armour Laboratories, a division of Armour & Company, Fort Worth, will erect a laboratory to process plasma; 100 by 100 feet, air conditioned.

GALVESTON — pipe line — Lone Star Gas Co., Paul E. Nicholls, Gen. Mgr., applied for permission to construct natural gas pipe line from Sixty-first and E Sts. to air base.

WEST VIRGINIA

FAYETTEVILLE — plant — Woodward Publications, Inc., Spencer, W. Va., will rebuild burned plant on original site; contract will probably be let to Hill Construction Co., Oak Hill, for concrete building, work to start in about 2 weeks.

Contract Stage

FLORIDA

HILLSBOROUGH COUNTY — railroad tracks — A. S. Wikstrom, Jacksonville, has contract for railroad spur tracks for U. S. Engineer Office, Jacksonville; under \$50,000.

MIAMI — shop building — Witters Construction Co., 1745 S. W. Sixth St., has contract for addition to shop building, N. Miami Ave. for Florida-Georgia Tractor Co., 3139 N. Miami Ave.; L. B. Taylor, Engr., Congress Bldg.

ORANGE COUNTY — railroad spur tracks — Langston Construction Co., Orlando, has contract for additional railroad spur tracks for U. S. Engineer Office, Jacksonville; under \$50,000.

GEORGIA

Additional plant facilities—Defense Plant Corporation announced increase in contract with National Cylinder Gas Co., Chicago, Ill., to provide additional plant facilities in Georgia at cost of \$60,000; over-all commitment of about \$150,000.

Plant facilities—Defense Plant Corp. announced award of contract to Firestone Tire & Rubber Co., Akron, Ohio, to provide plant facilities at cost of \$600,000.

KENTUCKY

Additional facilities—Defense Plant Corporation completed contract with Reynolds Metals Co., Louisville to provide additional facilities for a plant in Kentucky at a cost of \$300,000, resulting in an overall commitment of \$5,000,000.

LOUISIANA

Additional equipment — Defense Plant Corporation granted contract to Standard Oil Company of Louisiana, New York, to provide additional equipment for a plant in Louisiana at cost of approximately \$140,000, resulting in an over-all commitment of approximately \$9,500,000.

LEESVILLE — enlargement — Southern Bell Telephone & Telegraph Co. enlarging dormitory space on second floor and operators' cafeteria; second floor addition is being constructed to provide enlarged quarters.

NEW ORLEANS — rest room, transformer station, Otis W. Sharp & Son, 1835 Robert St., has contract for general work for colored women's rest room, cafeteria No. 1,

for Delta Shipbuilding Co., Inc.; Weisfeld & Son, 740 Camp St., has contract for additional transformer station; O. O. Carpenter, plant facilities engineer.

MARYLAND

BALTIMORE — alterations — Defense Plant Corp., Washington, D. C., starting work on alterations to distillery, 400 S. Central Ave.; Carrollton Springs Pure Rye Distillery, Inc., lessee and operator; Armiger construction Co., 2128 Maryland Ave., Gen. Contr.; Asphalt Roofing Co., 2346 E. North Ave., has contract for roofing; Paint Engineering Co., 1428 E. Baltimore St., painting; Henry J. Knott, 2122 Maryland Ave., brickwork; Eastern Glazing Co., 2012 N. Washington St., glazing.

BALTIMORE — Baltimore and Ohio Railroad, sell the first \$3,500,000 block of its projected \$10,760,000 equipment trust certificate issue to Halsey, Stuart & Co., 35 Wall St., New York, subject to approval of Interstate Commerce Commission. The bid submitted by the New York concern was 100%. Fixed interest has been set at three per cent, payable semi-annually. New equipment to be added to B. & O. operations under the program includes 20 Mallet steam locomotives, each involving expenditure of \$272,457, or a total of \$5,449,000 item. These will be built by the Baldwin Locomotive Works, Philadelphia, and make up the largest single item under the program. Three Diesel freight locomotives have been ordered from Electro-Motive Corp., LaGrange, Ill. Fifty-four thousand horsepower units, they will cost \$503,000 apiece. Fifteen Diesel switchers will also be built at cost of \$78,700 each. Part of the order was to be carried out by American Locomotive Co., New York; the balance by Electro-Motive organization. Exigencies of war may require change of the schedule, however. Nine hundred sixty-five 50-ton composite hopper cars are also on order under the program. Being built by Bethlehem Steel Co. they will cost \$2,723 each. These cars, which may combine use of wood and steel due to scarcity of the latter, are part of a 1000 car program, 35 of which have been placed in a previous equipment trust.

BALTIMORE — carpenter and box shop — H. J. Dudley, 102 W. Chase St., has contract for carpenter and box shop, 1301 Wilcomico St., for Revere Copper & Brass Co.; cost \$10,000; masonry and steel; 1-story; Jaheek & Chumann, Architects, Chicago, Ill.

BALTIMORE — building — George G. O'Brien, 630 Hunter St., has contract for building, rear of 1403 Eutaw Place for Seal Test Laboratories; 1-story; brick.

BALTIMORE COUNTY — office — Jackson Construction Co., 13 W. 25th St., Baltimore, has contract for office building, North Point Rd., for Eastern Rolling Mill Co.; 3-story; brick; cost \$60,000.

CURTIS BAY — fuel oil tank — Lloyd E. Mitchell, Inc., 2315 Cecil Ave., Baltimore, has contract for fuel oil tank and pump house for Davison Chemical Co.

HALETHORPE — fermenting house — Baltimore Contractors, 15 N. Central Ave., Baltimore, has contract for addition to fermenting house for Monumental Distillery; cinder block; 33x50 ft.

ODENTON — interlocking and block station — Pennsylvania R. R. Co., W. B. Woods, 301 Pennsylvania Station, let contract to Baltimore Contractors, 15 N. Central Ave., Baltimore, for interlocking and block station.

MISSISSIPPI

HARRISON COUNTY — gasoline storage — U. S. Engineer Office, Mobile, Ala., let contract to Kelly-Geneser Construction Co., New Orleans, La., for construction of gasoline bulk storage system in Harrison county; under \$43,000.

WASHINGTON COUNTY — warehouse — U. S. Engineer Office, Mobile, Ala., let contract to Glenn & Hamilton, Hattiesburg, for addition to warehouse building at airfield in Washington County; Inv. No. 569-43-708.

MISSOURI

Additional plant facilities—Defense Plant
(Continued on page 48)

Ships That Are Famous in This War

An attractive booklet from the Newport News Shipbuilding and Dry Dock Company, which was issued particularly for their employees, features the part played in the present war by some of the ships built by this outstanding Southern company. Names that have made history in this war appear in the list of naval vessels built at Newport News. Gunboats, destroyers, cruisers, battleships and aircraft carriers—names that have become famous from Pearl Harbor to the Islands of the South Seas appear in the list of ships to which the employees and the company have given so much of their labor and loyal thought. Official United States Navy photographs provide profuse illustrations.

The map which accompanies the work is well worthy of preservation because of the detail in which it shows the South Pacific islands where our forces are now engaged.

Record of Merchant Shipbuilding

According to a report from the U. S. Maritime Commission, United States merchant shipyards during April again broke all previous world records for ship production by delivering into service 157 ships totaling 1,606,600 tons deadweight.

The announcement significantly states—"delivery of five merchant ships a day now is becoming routine. April construction was at an annual rate in excess of 19,000,000 tons deadweight."

Of the total of 157 ships delivered during April, 13 Southern shipbuilding companies delivered a total of 55.

Ceilings on Southern Pulpwood

Ceilings on prices for pulpwood produced in South Carolina, Georgia and Florida have been ordered by the Office of Price Administration. The 60-day freeze on prices established in March in the whole Southeastern district was made permanent without changes for the nine other states in the district.

All pulpwood produced in the three states named above, now has the following ceilings f.o.b. car or barge:

Southern Pine \$6.80 per cord
Rough Southern

Hardwoods 7.30 per cord
Peeled Southern

Hardwoods 10.00 per cord

Dealers in pulpwood, synonymous with brokers in other fields, are granted an allowance of 50 cents per cord, payable only on sales conforming to specified requirements, mainly that the dealers have no part in the production of the wood. In no case can more than one dealer's allowance be paid on each cord of wood, nor can a dealer's allowance be divided or split.

The above, with further details, contained in OPA order No. 2439.

Viscose Official Stresses Research

THE responsibility of large industrial corporations to conduct research on a broad scale in order to do their part in planning for the future social and economic well-being of the country was stressed by H. Wickliffe Rose, of the American Viscose Corporation, in an address delivered before the Practicing Law Institute at New York.

"The larger the industrial corporation and the more complex its business, the more people it involves, and the larger its place in the social structure of the country, the more necessary it becomes for its management to maintain a perspective gained by all these considerations, and to contribute its share in planning for the future" Mr. Rose emphasized.

"In a highly competitive business, research is considered necessary to the survival of the corporation. In fact, research creates competition and in many industries a competitive race in itself," Mr. Rose said. "It is argued by some that research creates wealth by increasing the market value of the corporation. At least it creates products, jobs, and whole industries, and certainly they create wealth in turn.

"One prospect which seems to be fairly certain, if we can reason by analogy, is that after the war there will be a tremendous surge of research, development, and production. Statistics of the Patent Office show that during each war there has been a leveling off of the number of patents issued, but following the war in each case there has been a sharp rise in the number.

"Following the Civil War the number had tripled by the second year. After the Spanish-American War the number increased almost steadily from approximately 42,000 in 1900 to approximately 70,000 in 1914. After the World War the number jumped to over 90,000 in 1921. The patent curve follows very closely that of economic prosperity.

"Reading such charts, one can hardly fail to note the depressions that follow these booms after each major war. Reasoning further by analogy, and assuming that there will be a business boom after the present war, the natural reaction is to try to guard against the depression which seems to be nearly as inevitable. The planning of research, patents, building, and expansion should extend at least that far in the future.

Research today is being used broadly with sixteen objectives. Mr. Rose pointed out. These are: to improve production technique, lower production costs, modify products, improve products, create new products, conserve materials, provide raw materials and supplies, create employment, inform employees, improve working conditions, improve environs of plants, assist customers, assist consumers, widen markets, develop specific information, and advance the general field of knowledge.

"These objectives form the basic policy in the conduct of a benevolent industrial business, where benevolence arises from the conviction that, when the ultimate public

interest is best served, the survival of the economic system and the economic unit is most nearly assured.

"In the rayon industry it will be found, in spite of theories to the contrary, that the technological changes which supplant jobs, compensate in the aggregate by broadening the consumer acceptance of the product, expanding production, and affording other employment within the industry," said Mr. Rose. The new developments that are taking place now, if properly commercialized after the war, will undoubtedly mean an increase in production and employment, thereby assisting in the major problem of absorbing the manpower released by the war and of readjusting industry to peacetime pursuits.

"The planning of research and development in wartime is being conducted, probably quite generally, in such a way that the war program comes first, and that wherever the war developments may have a future use, those uses are planned on paper at least. Without interfering with the war program, but coincident with developments for that program, a certain amount of textile research is being conducted, in order to have at least a few of the answers ready when the great day comes.

"Following the establishment of rayon, the first man-made fiber, the creation of new synthetic fibers has opened another era in the textile industry. Synthetic fibers are closely related to plastics, which in turn are made from chemicals, and as a result we now find industries overlapping with this inter-relation of products. Rayon and synthetic textiles are now being made, in addition to the all-rayon companies, by companies which also make powder, paints, cameras, dairy products, glass, tires, and automobiles.

"The creation of new materials by new combinations of atomic building blocks is thrilling and

(Continued on page 62)

*scientific
scrutiny
seen to
quicken
business,
create
products,
make jobs*



"Just getting the wire laid was a tough problem. Keeping it intact in bombings, shellings and adverse weather is a twenty-four-hour proposition. . . . Wire repair crews are made up of four men. Three stand guard while the other works."

(From story by Sgt. James W. Hurlbut, Marine Corps Combat Correspondent)

Telephone Exchange on Guadalcanal

Marine communications men built it under fire. And it has been kept built. The "Guadalcanal Tel & Tel" covers well over a thousand miles of wire.

That is where some of your telephone material went. It's fighting on other fronts, too. We're getting along with less here so they can have more over there.

Telephone lines are life-lines and production lines in a war. Thanks for helping to keep the Long Distance wires open for vital calls to war-busy centers.

WAR CALLS COME FIRST

BELL TELEPHONE SYSTEM



West Virginia Plant Starts Rubber Output

(Continued from page 27)

M. Jeffers, the rubber director, are to bring enough synthetic rubber-making capacity into production to balance the supply and demand; to maintain enough of the natural crude stockpile to make heavy duty military tires, self-sealing tanks and "other military items for which synthetic rubber is not yet adequate" and to further develop capacity of the synthetic rubber industry and quick sources of natural rubber to care for 1944 needs.

These needs, he pointed out, were: Added requirements of our allies as their inventories disappear; replacement of depleted inventories of necessary industrial equipment; replacement during 1944 of essential civilian tires; use of rubber by military authorities in many essential categories. The requirements are closely intertwined, he said, but it is the first that, "has given rise to the demand that highest priorities be given to rush the plants necessary to balance the absolute minimum of immediate consumption with new supply."

Manufacture of synthetic rubber by United States Rubber Company at Institute Plant typifies the magnitude and success of the Government's synthetic rubber program under the leadership of Mr. Jeffers, former railroad official, and represents one of industry's most vital contributions to the war effort. It makes available in quantity a new raw material of industry to replace sorely needed natural rubber.

Buna S. may be considered not merely a substitute for natural rubber, but a new raw material of industry with a character of its own, superior to the natural product in certain respects and with great possibilities for the future. The art of making rubber synthetically consists in choosing suitable raw materials, combining them in proper proportions and causing the molecules to polymerize or hook up in the proper pattern by the action of special chemicals and the exact control of time, temperatures and pressure.

At the Institute Plant these intricate molecular changes are accomplished on an enormous com-

mercial scale. The liquid styrene and the gas butadiene, in liquid form under pressure, arrive by pipe line from the adjacent raw materials plant operated by Carbide & Carbon Chemicals Corp. They are stored in great tanks. The storage tanks will hold enough raw materials to make 190,000 passenger car tires.

There is a central meter room in the area for mixing the raw materials and the other special chemicals. The operator throws a lever and the predetermined amount of the proper material flows through a main pipe line into the reactor where polymerization takes place. Ingredients include butadiene, styrene, the soap solution, the catalyst, other chemicals in solution and water. The oily butadiene and styrene are emulsified in the soap solution by whipping them into small droplets like the droplets of oil in a salad dressing.

Actual polymerization may now begin, and it follows principles discovered in the general laboratories of United States Rubber Co. in December of 1923 and disclosed in the Company's patent No. 1,910,846. Temperature of the batch is controlled by a water jacket surrounding the reactor. As polymerization proceeds, the droplets become more viscous, or thicker, and more rubber-like. The emulsion is now no longer one of an oil in liquid, but an emulsion of a soft solid in a liquid. This is now a synthetic rubber latex.

Progress of the reaction is carefully checked and when polymerization has reached the proper point the batch is run off to the "blow-down" tanks where polymerization is arrested. In the blow-down tanks the synthetic rubber latex is tested. The hydrocarbons which have not combined are then recovered. Volatile butadiene is separated from the mixture by letting it boil off as a gas and it is recovered by compressing it again. The styrene must be recovered by boiling under reduced pressures at higher temperatures.

The batch of latex, containing 25 per cent synthetic rubber, is treated with an anti-oxidant which prevents deterioration. Many batches of latex are bulked and blended for uniformity of product

in 30,000-gallon concrete storage vats. Then it is coagulated by salt and acid and the small particles coalesce as larger flocs or crumbs. In coagulation 70 tons of rock salt will be consumed daily.

After coagulation, the rubber crumb is washed and pressed to remove the excess water, and the rubber is dried by passing back and forth three times through large driers. The twelve driers at Institute Plant will evaporate 160 tons of water per day. The dried rubber is then weighed in an automatic scale which feeds 75 pounds to the baler where it is pressed into a loaf 14" x 28" x 6". Nine thousand such loaves will be produced every day by the Institute Plant in full operation. S.A.L.

Industrial Expansions

(Continued from page 45)

Corporation announced increase in contract with McDonnell Aircraft Corp., St. Louis, to provide additional facilities for plant in Missouri; cost, \$116,000; over-all commitment of about \$650,000.

KANSAS CITY — plant — Prier Brass Manufacturing Co., 15th and Blue River, starting addition on west side of plant; foundry will be rearranged and install new vault for patterns.

ST. LOUIS — hangar — St. Louis Aircraft Corp., 8000 N. Broadway, let contract to St. Louis Car Co., 8000 N. Broadway, for 1-story frame and steel airplane hangar; C. D. Clawson, Architect, 8000 N. Broadway.

ST. LOUIS — warehouse alterations — E. Meyer, 3970 Connecticut St., has contract for warehouse alterations, 4900 N. Second St., for F. Burkart Manufacturing Co., 5000 N. 2nd St.; enclose open warehouse with brick walls and steel sash; 230x342x64x164 ft.; rein. conc. found.; cost \$10,000.

NORTH CAROLINA

Additional equipment — Defense Plant Corp. authorized execution of contract with Carolina Aluminum Co., Badin, N. C., to provide additional equipment for plant in North Carolina; cost \$160,000.

HAZELWOOD — building — Daniel Construction Co., Greenville, S. C., has contract for building for Dayton Rubber Co.; cost \$300,000.

OKLAHOMA

Coal mines—McAlester Fuel Co., McAlester, Okla., as engineer-contractor for Defense Plant Corp., is developing 2 mines at Carbon Station on Missouri-Kansas-Texas rails about 8 miles west of McAlester, Pittsburg County and one large mine about 2 miles west of town of McCurtain, located on Fort Smith & Van Buren division of Kansas City Southern R. R. in Haskell County; these coal mines are to supply coking coal, which is to be shipped to Lone Star Steel Co., at Daingerfield, Tex., and Sheffield Steel Corp., of Texas at Houston, Texas; company plans erection of approximately 150 houses for miners at both Carbon and McCurtain and approximately 15 better homes for mine foreman, etc.; at each village the Defense Plant Corp. will supply water and electricity and at Carbon natural gas will be available from a natural gas main.

Gas line—J. A. Krug, Director, Office of War Utilities, War Production Board, announced pipe line to insure adequate natural gas supplies for mid-continent area, bounded roughly by Wichita, Kansas, Kan-

(Continued on page 52)

In Credit...First Things First

Make way for war credit! That is a commercial bank's first job these days.

For that purpose First and Merchants has ample capital funds and 78 years of first-hand experience with many Southern industries, especially cotton manufacturing.

Is expansion your problem—or another location—or financing materials? Inform us about your situation. We are sure we can be helpful.

FIRST AND MERCHANTS National Bank of Richmond

John M. Miller, Jr., Chairman of the Board

H. Hiter Harris, President

CAPITAL AND SURPLUS SIX MILLION DOLLARS

Member Federal Deposit Insurance Corporation

EPPINGER AND RUSSELL CO.

Wood Preservers Since 1878

All kinds of Structural Timbers and Lumber
Pressure Treated with Creosote Oil or



80 EIGHTH AVE., NEW YORK, N. Y.

POLES • CROSS ARMS • PILING • TIES
POSTS, BRIDGE AND DOCK TIMBERS

Treating Plants—JACKSONVILLE, FLA. • LONG ISLAND CITY, N. Y.

Exceptional Facilities for the Collection of Drafts

Remittance made on day of payment.

BALTIMORE COMMERCIAL BANK

ROBERT C. WILLIS, JR., President

BALTIMORE, MARYLAND

Member Federal Reserve System
Member Federal Deposit Insurance Corporation

INDUSTRIAL SURVEYS

*in the
Seaboard Southeast*

FOR MANY YEARS we have helped industry by furnishing reliable surveys on industrial locations in the Seaboard Southeast.

MORE RECENTLY we have likewise assisted numerous Government agencies by supplying authentic reports on various parts of our territory.

OUR PRIME OBJECTIVE:—To contribute to our Country's war effort in every possible way until victory is won.

INDUSTRIAL DEPARTMENT SEABOARD AIR LINE RAILWAY

WARREN T. WHITE
General Industrial Agent
Norfolk, Va.

THE BALTIMORE AND OHIO RAILROAD COMPANY

SUMMARY OF ANNUAL REPORT FOR THE YEAR 1942

The annual report of the President and Directors covering operations of the Company for the year 1942 is being mailed to its stockholders.

RESULTS OF OPERATIONS

The audited income account of the Company for the year 1942, as compared with 1941, is summarized as follows:

	Year 1942	Year 1941	Increase over 1941
Railway operating revenues	\$306,254,193.49	\$227,503,021.56	\$ 78,751,171.93
Railway operating expenses	204,241,198.76	160,918,417.51	43,322,781.25
Net railway operating revenue	\$102,012,994.73	\$ 66,584,604.05	\$ 35,428,390.68
Railway tax accruals (including Federal income taxes)	25,054,012.87	15,780,105.71	9,273,907.16
Railway operating income	\$ 76,958,981.86	\$ 50,804,498.34	\$ 26,154,483.52
Equipment and joint facility rents— Net Debit	7,400,263.88	4,507,373.81	2,892,890.07
Net railway operating income	\$ 69,558,717.98	\$ 46,297,124.53	\$ 23,261,593.45
Other income	8,670,683.14	8,306,748.01	363,935.13
Total income	\$ 78,229,401.12	\$ 54,603,872.54	\$ 23,625,528.58
Miscellaneous deductions from income	1,685,984.95	2,004,180.92	D 318,195.97
Income available for fixed and other charges	\$ 76,543,416.17	\$ 52,599,691.62	\$ 23,943,724.55
Fixed interest and other charges	19,833,257.08	20,141,033.67	D 277,776.59
Income available for other purposes	\$ 56,680,159.09	\$ 32,458,657.95	\$ 24,221,501.14
Other interest charges contingent only as to time of payment	11,356,562.50	11,366,775.00	D 10,212.50
Audited net income	\$ 45,323,596.59	\$ 21,091,882.95	\$ 24,231,713.64

(D) Denotes decrease.

This summary does not give effect to an appropriation for capital fund which is deductible from "Income available for other purposes" and before contingent interest charges; to the appropriation from net income for sinking fund; nor to certain adjustments to conform to the provisions of the Modification Plan of August 15, 1938, all of which are dealt with fully in the annual report.

There was a net decrease of \$11,572,108.85 in outstanding interest bearing obligations made during the year, including \$3,000,000 of Cincinnati, Hamilton & Dayton R. R. Co. General Mortgage 5% Bonds which matured June 1, 1942.

The recorded investment of the Company in property used in transportation services as of December 31, 1942, is \$1,005,867,783.46 against which depreciation has accrued in the amount of \$118,647,600.50, leaving the net recorded value \$887,220,182.96.

Through the medium of a conditional sale agreement three multiple-unit Diesel electric freight locomotives were acquired and placed in service during 1942 and there were also acquired and placed in service 687 new steel freight-train cars. To accommodate increased traffic 50 caboose cars were constructed at Company shops. Four locomotives, two passenger-train cars, 81 freight-train cars, and some work equipment were rebuilt and modernized at Company shops. During the same period 28 locomotives, two passenger-train cars, 173 freight-train cars and some miscellaneous equipment were retired from service because of obsolescence or other causes.

In March, 1942, the Company placed orders for early delivery of 1,000 box cars and 1,000 hopper cars, each of 50 tons capacity, but because of restrictions emanating from the War Production Board this equipment was not allotted to the Company; however, under a directive recently issued by that Board, the Company is permitted to acquire 525 composite hopper cars which are expected to be received some time in 1943.

The Directors of the Company authorized the acquisition of three multiple-unit Diesel freight locomotives and twenty-five Diesel switching locomotives, and it is now anticipated that, pursuant to orders placed with manufacturers, a number of these units will be delivered during 1943. Recently, orders were placed for twenty heavy freight locomotives which have been scheduled for delivery during the closing months of this year.

Ten Diesel switching locomotives were ordered last year for service within the Chicago switching area, six of which were delivered in 1942 and four in the early months of this year, and the acquisition of nine similar locomotives, for service in the Staten Island area of New York City, has been authorized.

Railway tax accruals, an uncontrollable item of expense, for the year 1942 aggregated \$25,054,012.87, an increase over 1941 of \$9,273,907.16, or 58.77%, of which \$18,065,239.16 is for Federal income pay roll and capital stock taxes, and the remainder, or \$6,988,773.71, for state and local taxes. Taxes for the year absorbed 24.56 cents out of each dollar of net operating revenue and were equivalent to \$4.00 and \$8.85 per share respectively on Company's preferred and common stock outstanding, on which no dividends were paid and, together with miscellaneous tax accruals, were equivalent to \$463.51 per employee.

R. B. WHITE, President.

Ingalls Luxury Liner

(Continued from page 29)

do—just to show the stuff she was made of.

She's an 18,000-tonner, mined in

the hills around Brimingham, Ala., fabricated at the Ingalls Iron Works there and railroaded to Ingalls' gulf coast shipyard on flat cars and trucks over Ingalls' famed

"300-mile production line," and welded into a ship on the ways of the Singing River, \$7,500,000 FOB Pascagoula.

Her quarters for troops below decks are efficient with space, but not packed. The bunks themselves are canvas webs in tubular steel frames, slung two-abreast in three tiers. Revised plans for the interior were drawn to give the enlisted man every comfort possible. The bunks turn up during the daytime to make plenty of recreational room in the long halls. Men of World War I would get a real kick out of her spaciousness. There is no sleeping in shifts in this man's "Over There-bound" Army of 1943.

Commissioned officers' quarters are the staterooms, equipped with modern furniture, double-decked beds, reading lamps and telephones. Lounges and a soda fountain and snack bar, are other 1943 concessions to a fighting man's comforts during a tense voyage to the other side.

There is a cafeteria to feed the troops. Then luxury rears its head again in the lavatories, where battalions of glistening appointments and facilities, an individual mirror over each washbowl, stretch along the walls. Her fully equipped hospital has operating rooms and isolation wards.

One of the first warships turned out of the nation's first yard designed for all-welded ship construction, she hasn't a rivet in her, but is fused together into one great piece of steel from her keel up. There is no excess weight of overlapping plates, where rivets would go through, and no rivet heads to add water resistance and slack her speed.

Wood Substitutes for Five Million Tons of Metal

Conversion to wood of products previously manufactured of metal will release to war service more than five million tons of metal during 1943, technicians of the National Lumber Manufacturers Association, Washington, D. C., estimate. This figure is compiled from reports of WPB, Army, Navy, Maritime Commission, Forest Service, Census Bureau, and industrial concerns.

The industrial effort has shifted from construction to production. Wood is being used this year to replace metal in a long list of civilian products that have been largely curtailed or discontinued, as well as being diverted into essential war uses other than construction.

Expenditures for construction in 1942 reached an all-time high of \$6,170,000,000. Had it not been that timber replaced structural steel so extensively, a building program of this magnitude would have been impossible. The savings of structural steel in roof trusses alone through the use of timber connector construction has been estimated by the Timber Engineering Company at 400,000 tons.

When the manufacture of metal furniture was stopped, that portion of the furniture industry reverted to wood. That was followed shortly by the estoppel of metal springs for upholstered furniture, and the industry met the crisis with a new development—wood springs.

The range of consumer goods in metal that have been estopped or seriously curtailed and have reverted to wood in whole or in part, is surprising: mechanical refrigerators, caskets and vaults, door and window screens, mirror and picture frames, certain farm implements, beauty shop equipment, children's vehicles, athletic equipment, lawn mowers, slot vending machines, radios, carpet sweepers, weather strip, gutters and downspouts, bottle caps, pocket books, atomizers, bathtubs, jelly molds.

Wood is pulling an extra oar on the home front, although the pressure for direct war service has not relaxed. While the shipyards and cantonments are built, demands for wood continue to tax the utmost efforts of the forest industries. Probably the greatest single consumer of lumber this year is the box and crate industry. Nearly one-third of the total 1943 production of lumber, or 10,500,000,000 board feet, will be used for boxes and crates for shipment of military supplies, according to the best authority.

Shells of Steel

(Continued from page 31)

ened to insure complete obturation. It is necessary to have a much higher yield strength on a steel cartridge case than brass and in the 75 mm size this yield strength must be upward of 100,000 pounds per square inch."

To accommodate these requirements Buick metallurgists and die specialists, long experienced in deep drawing of steel in automobile production, devised a successful manufacturing method utilizing machines and equipment on hand and requiring a common carbon steel which was readily available in contrast to alloyed steels higher on the critical list.

The process makes use of former sheet metal stamping equipment which prior to this development was not adaptable to war production.

(Continued on page 54)



Wherever There's WAR ACTIVITY There's a DISTRIBUTOR Serving It

The distributor is rendering an indispensable service these days. With his complete familiarity with requirements and sources of supply, he is helping hard-pressed procurement offices to obtain vitally needed equipment and supplies for the Army, Navy, Maritime Commission and Air Force...not to mention his services to the thousand-and-one other industries engaged in war work.

He's alive to the needs of the times and his wide experience qualifies him as the logical force to ferret out those needs...he's here, there and everywhere—any hour of the day or night. He knows that he justifies his existence only in the measure that he renders service.

Long ago, Lunkenheimer recognized the distributor as the most efficient and economical means of marketing its products and built up nation-wide distribution through leading supply houses. We salute these distributors for the outstanding job they are doing in helping to speed up war production.



ESTABLISHED 1862
THE LUNKENHEIMER CO.
"QUALITY"
CINCINNATI, OHIO, U.S.A.
NEW YORK CHICAGO
BOSTON PHILADELPHIA
EXPORT DEPT. 318-322 HUDSON ST., NEW YORK

LUNKENHEIMER VALVES

28-1020-62

Business at the Crossroads

(Continued from page 34)

reserve and see to it that these "reservists" are fairly treated and are not made to feel, even for a short time, that they are a burden on society. Considering our great productive capacity such provision would not indeed prove burdensome, assuming that we keep our economic machine functioning and maintain our labor reserve at a reasonable figure.

Certainly free competition must be maintained, yet steps should be taken to prevent it from becoming destructive. This need not mean relaxing of anti-trust restrictions or undue government regulation, but it does suggest that trade associations in collaboration with the F. T. C. should be able, with due process, to step in to cure situations which are benefitting neither the public nor the parties concerned.

Considering our success in merchandising to the public, is it too much to hope that we can sell labor on the idea that it is a partner of management in creating the revenue from which wages as well as profits are derived? Such confidence can be inspired by a willingness to pay labor as much as possible rather than as little. This could be done through an extension of profit-sharing, especially in the form of stock; with incentives for better work and for worthwhile ideas and with the hope of advancement in the organization as rapidly as justified. Let us strive to employ machinery at peak efficiency and for large production at low cost, but so pay labor that it can buy these products. A new code of ethics might insist that competitive price advantage be not obtained through underpayment of labor and that buyers preferentially deal with manufacturers who are making a reasonable profit rather than those who are undermining the system by failure to make a profit or are doing so at the expense of some other element.

Many businesses have come to understand what our civilization owes to science and the scientific method and have made tremendous strides. Our larger enterprises spend millions on research but

there are still many who have not yet capitalized on research. It is difficult to over-emphasize the importance of research to the future of a business—if it wants a future—and such a program can be started on a small scale, if need be, with one man with training and ideas—and cooperation from the management. Chemurgy—the application of science to finding uses for farm products in industry—is an important step forward in putting scientific research to work on economic problems as well as direct human needs and in my opinion deserves the support of all business men.

Let us not forget to tell our story to the public and to keep on telling it. People are apt to think of business as a special sort of creature, angel or demon, according to the politics of the speaker. But that is not so. Business is "busy-ness"; it is all of us, big and little, engaged in supplying useful goods and services. People, including business executives, should realize that our fortunes are tied together in the economic world—just as in world affairs—and if the experience of the last twenty-five years is any teacher they will realize it. Let business proudly tell of its record but not forget to continue going forward so that we can talk in the present as well as the past tense.

In the better world to come after the war business can and I am sure will be a powerful force for peace and better understanding. By this time we should have learned the trade, including international trade, can't be a one-way-street among nations. We shall be getting a lot of new customers in lands no longer distant—we will be measuring distances in hours instead of miles. Many of us I know are laying postwar plans. As we look into this bright future let us hope too for the necessary healthy cooperation between government and business. Ours is a large share of the responsibility that rests on all to make certain that when the boys come home they will find a world they will be glad to have saved. Each should ask himself what he is doing toward this end.

Industrial Expansions

(Continued from page 48)

sas City and Springfield, Mo.; the 26-in. line will run from center of Texas County, Okla., 240 miles eastward to Cities Service system's connection at Blackwell, Okla.; Cities Service will build the line; will deliver up to 140,000,000 cu. ft. of natural gas daily from rich Hugoton field in Oklahoma and Kansas; an estimated 55,000 tons of steel will be required to complete the line; estimated cost \$15,000,000.

Plants — Colonel F. J. Wilson, District Engineer, U. S. Engineer Office, Tulsa, has announced the awarding of architect-engineer contracts for two military construction projects to be located in Tulsa and Oklahoma counties, each costing in excess of \$5,000,000; one contract was let to Austin Co., offices in Oklahoma City, and the other to J. Gordon Turnbull & Sverdrup & Parcel with offices in Tulsa; work on the design is proceeding rapidly and actual construction is expected to begin in 2 weeks.

TENNESSEE

Additional equipment — Defense Plant Corp. authorized execution of contract with Aluminum Company of America, Pittsburgh, Pa., to provide additional equipment for plant in Tennessee at cost of \$160,000.

NASHVILLE — cold storage — Swift & Co., let contract to Vagtharg Construction Co., for remodeling cold storage plant, 1306 S. Adams St.; brick and tile partitions; firebrick cold storage; \$20,000.

TEXAS

CONROE — plant — Columbian Carbon Co., M. R. Howell, resident engineer started work on clearing of plant site; pouring of concrete for warehouse foundation will begin at once.

FORT WORTH — warehouse — Hutchinson Pipe & Waste Material Co., Fort Worth, will erect warehouse; one-story; concrete and tile, 601 N. Throckmorton St.; owner builds.

HOUSTON — plant addition — Koppers Co., 1919 Collingsworth St., Houston, will erect plant addition of brick and frame; approximate cost, \$10,000.

TEXAS CITY — refinery — Bace-Marshall Co., 4009 Center St., Houston, has contract for laboratory building, 66x66 ft. and office, 70x69x59x26 ft., triangle shape and miscellaneous buildings; brick and structural clay tile on rein. conc. foundations and floors.

VIRGINIA

VA., RICHMOND — Chesapeake & Ohio Railway Co., Cleveland, Ohio, placed following contracts for equipment, costing \$14,500,000: Construction of 40 locomotives to American Locomotive Co., Schenectady, New York, at cost of \$7,600,000; for 1250 coal cars of hopper type to Pullman-Standard Manufacturing Co., Michigan City, Ind., and 1150 cars to General American Transportation Corp. of East Chicago, Ind.

Plant facilities — E. I. du Pont de Nemours & Co., Wilmington, Delaware, received contract from Defense Plant Corp. to provide plant facilities in Virginia and New York; value of \$4,400,000.

Contracts and Sub-Contracts Wanted By Government

(Continued from page 43)

measurements: O. D. 6.052" x 1 1/4" width; Gear Face 5/8"; Bore .983" plus .001". 54 teeth. 14 1/2 degree pressure angle. Module—2.75. Material: S.A.E. 3140 Forging Grade Steel. Heat treat scleroscope 38 to 43.

Ref. Buescher-19-1

A Government Agency requires 950 FUEL PUMP DRIVE GEARS for Diesel Engines. Delivery required: 90 days after date of contract. Dimensions: 2.441" O. D. x 1 1/4" width; Bore—1.3755" — .001". 20 teeth, 10 pitch, 26 degrees, 50 minutes R. H. Helix.

(Continued on page 58)



Under this **Carey** BUILT-UP ROOF

Millions of Pounds of Burley Tobacco are Warehoused and Sold

Carey Roofs likewise are serving industry generally throughout the nation, including huge war plants where roof protection of the utmost dependability is vital.

Carey Roofs have a reputation of wearing longer, at lower yearly cost. They have earned this reputation because they are individually engineered and built to withstand such factors as salt air, chemical fumes, or any other adverse conditions under which they must serve. You're always **SAFE** with a **CAREY** Roof. A nationwide organization is ready to serve you. For details, address Dept. 61.

THE PHILIP CAREY MFG. COMPANY

Dependable Products Since 1873

LOCKLAND

CINCINNATI, OHIO



BEFORE AFTER
FIRST SQUADRON ARMORY, PHILADELPHIA, PENNA.
6,000 SQ. FT. WHITE CORRUGATED WIRE
GLASS SKYLIGHT

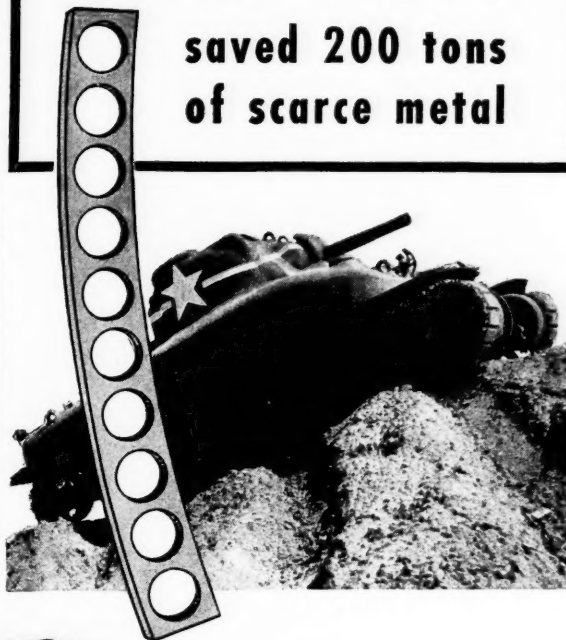
**SPECIFY
ORIGINAL SOLID CORRUGATED
WIRE GLASS SKYLIGHTS**

PENNSYLVANIA WIRE GLASS CO.

1612 MARKET STREET
PHILADELPHIA, PENNSYLVANIA

THIS REDESIGNED TANK PART

**saved 200 tons
of scarce metal**



Little things *do* count. For example, this ball retainer ring for tanks (total weight only a few pounds) was redesigned to save 200 tons of a scarce metal on one tank order!

The designer who perfected the part applied lessons learned in the mass production of roller skates, bicycles and automobiles. Formerly the ball retainer ring was cast and machined from a critical metal. Now it is formed and punched from steel—all in one operation. Result: Enough metal saved to provide the rotating bands for 177,000 large shells. And this is just the beginning.

Almost every day some victory-minded engineer comes up with a new idea for the manufacture of war equipment. Peace-time products that might benefit from stampings will be redesigned too. The field is wide open for stampings that save weight, save time and machine hours.

Let us show you how ARMCO's special-purpose sheet steels can help you do the job you want. For complete information on coated and uncoated grades of sheet steels, write to The American Rolling Mill Company, 1495 Curtis Street, Middletown, Ohio.



**THE AMERICAN
ROLLING MILL COMPANY**

Shells of Steel

(Continued from page 51)

tion and existing heat treat and forge equipment were put into service.

The steel shell case is hot extruded and cold drawn through a series of operations including heat treatment from a billet of steel $3\frac{1}{8}$ inches in diameter by $13\frac{1}{4}$ inches deep. Perfect surface is given the metal by grinding, eliminating defects which would tend to carry through the subsequent operations. The billets also are inspected by a magnafux method which shows up internal imperfections.

After being brought to a specified temperature in an induction furnace, the steel blank is extruded in a standard forging press forming the cup for the shell case. On this press the upper die member is a hot die steel punch, nitrified for improved wearing qualities and rounded at the end to form a smooth radius at the base of the cup. The lower die has a cavity the

size of the formed cup, or virtually the same diameter as the heated blank.

The punch extrudes the blank from $13\frac{1}{4}$ inches to about 4 inches. A second hot operation is carried out after the piece has cooled somewhat. The second hot press is about the same as the first, except for slightly altered tooling, extending the draw two inches further, or to about six inches.

After cooling in air, the cup is cold sized in a press, drawing it out only slightly, followed by several operations including annealing, acid pickling, cleaning to remove scale and chemical treatment.

A spectacular step in the process is the series of four cold drawing operations, all carried out on a single 750-ton press, having four punch and die stations so arranged as to carry an approximately equal load of about 150 tons per station. The depth of the cold draw varies slightly over the four dies, being controlled by the length of the punch. Four men handle the press and during one stroke the six inch

cup is drawn to 15 inches and to the approximate form of the finished case, a total draw of nine inches with no substantial change in diameter.

According to Buick technicians, this is a real test of the drawing qualities of the steel and it is pointed out that few pieces are torn or split in these severe operations.

The case is cold headed in a press equipped with a two-stage indexing die, the steel in the base of the shell case being flared out so that the flange can be machined. Tapering the mouth of the shell case is considered one of the most critical steps since the cold steel must be made to flow into the desired taper without wrinkling or distortion and without the support of a punch on the inside. The case is simply forced into a tapered die cavity in two stages, both on the same press.

Punches used on all cold drawing operations are made of hardened high speed steel chromium plated. Lower dies in the cold operations are generally steel rings with tungsten carbide inserts on the working

(Continued on page 56)

DAY IN AND DAY OUT SERVICE With Little Maintenance Attention

Whitcomb locomotives almost run themselves. They are built that way. Their rugged construction will stand up under long hours of continuous service, and keep it up day after day. They are doing more than their share in speeding production, holding down costs, and moving the goods in all kinds of mills and manufacturing plants throughout the Land. If your business needs the best in haulage and switching, look into the merits and advantages of Whitcombs. Submit your problem. Let us try to help you solve it.

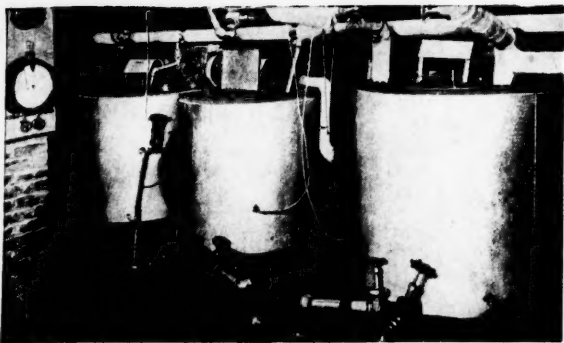


DIESEL, GASOLINE, MECHANICAL, OR ELECTRIC DRIVE—The Products of a Pioneer.

THE WHITCOMB LOCOMOTIVE CO.

Subsidiary of

ROCHELLE, ILL.
THE BALDWIN LOCOMOTIVE WORKS



Section of Battery built for Lanett Mills of West Point Mfg. Co., West Point, Ga.

Nickel-Clad Starch Kettles

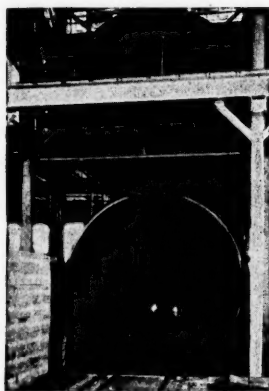
Fifteen starch kettles were made by us on this special job. These sizing kettles are made of Nickel-Clad steel to eliminate cracks and provide corrosion resistance. Monel metal agitators and heating coils were installed inside for greater strength, toughness, and freedom from contamination or discoloration of product. Welded construction throughout.

Starch boxes, kettles, jig boxes, etc., of Nickel-Clad steel as well as other metals made to order.

• Write for "Tank Talk"—No. 20-D.

R. D. COLE MANUFACTURING CO.
ESTABLISHED 1854
NEWNA GEORGIA

Lancaster TANKS



15'-3" O.D. x 40' Long Vulcanizer

ELEVATED TANKS—PRESSURE TANKS—STEEL STORAGE TANKS—PROCESS TANKS—BUTANE-PROPANE TANKS—STANDPIPES—RETORTS—BINS—EXTRACTORS—BARGES—DREDGE PIPE AND ACCESSORIES—WELDED PIPE—RIVETED PIPE

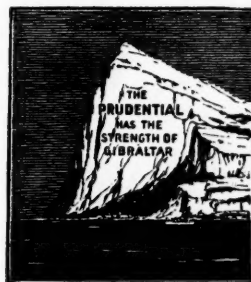
General Steel Plate Construction designed for your requirements.

LANCASTER IRON WORKS, INC.
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To Help You

Our "Modified" policies have adjusted premium arrangements which often will remove any necessity for risking a postponement of adequate life insurance.

A Prudential agent will be glad to explain them



The Prudential
Insurance Company of America

Home Office, NEWARK, N. J.

Shells of Steel

(Continued from page 54)

surfaces.

After tapering, the mouth end of the shell case becomes appreciably harder because of the cold working, so it is annealed once more. This softens up the mouth and assures complete obturation, that is, a tight seal in the gun barrel to prevent the explosion from blowing back into the breech.

The cases are inspected and transferred to automatic lathes which face the head, rough and finish form the flange and drill the primer hole. Reaming and counterboring the primer hole are performed on vertical machines and great care is required in these operations since specified tolerances are unusually close.

A final stress relieving is performed in a batch type electric furnace, this heat treatment adding approximately 10,000 p.s.i. to the yield and ultimate strength of the case. The coating specified to

provide protection from corrosion and sparking is an unpigmented phenolic varnish, the painting and baking operations being fully automatic. Once coated, the cases are carried slowly between two banks of infra-red lamps after which they are automatically cooled and readied for shipment.

According to Buick technicians, the inspection of 75 mm steel cartridge cases starts with receipt of raw material and ends with final acceptance tests required by Ordnance. Inspections include raw material, process and final inspection for acceptance. At the same time, test firing of production shells is carried out by the Army on a continuing basis.

Rubber Plant Project

(Continued from page 33)

principal ingredients, which comes either from a refinery or a coal tar distillation unit. After a purification process as they leave the tanks, the butadiene and styrene are piped to a polymerization structure, in which are located a number of

reactor tanks. Molecules of the two chemicals are united, or polymerized, in these tanks.

A section of the pigment storage building is used for mixing the various solutions, prior to sending them, through pipes, to the reactors to join the butadiene and styrene. After all of them are mixed, a milky solution results.

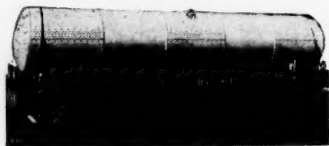
The mixture is piped to a recovery structure where certain of the materials which have not chemically united are recovered for further use. The mixture goes next to the rubber process building, where the emulsion is heated under pressure for a number of hours and discharged as synthetic latex, which must be coagulated, or thrown out of water suspension, washed and dried.

Adjoining the rubber process building is a storage building where the sheets of synthetic rubber are kept until sent to the various manufacturers to be made into rubber products. In addition, there are a number of auxiliary structures necessary. Cooling towers are used to treat the process water, and near them is a brine pit for refrigeration.

At the entrance to the plant, only a few feet from the parking lot, is a combined guard house and employment office, and less than a hundred feet distant is the administration building, which contains approximately 15,000 square feet of floor space and houses the offices necessary to keep the plant in operation.

SOUTHLAND PRODUCTS

—WELDED OR RIVETED—



We now manufacture and offer to the trade tanks in all sizes for pressure or gravity work. Also other steel equipment of either

WELDED
OR RIVETED
CONSTRUCTION

This applies to field as well as shop built equipment.

Write us for information and quotations.

CHATTANOOGA BOILER & TANK CO.
CHATTANOOGA, TENN.

DAVIS CYPRESS TANKS

MEET EVERY TANK NEED

They last indefinitely. Used throughout the South for over 50 years. Write us. Inquiries for wood pipe invited, also.



G. M. DAVIS & SON
P. O. Box 5, Palatka, Florida



CRUSHED STONE

Only highest grades of crushed
LIMESTONE AND GRANITE

Meeting all specifications

CAPACITY—8000 tons daily

Blue Ridge, Va. Pembroke, Va. Pounding Mill, Va.
Boxley, Greenville County, Va.

W. W. BOXLEY & COMPANY
Boxley Building, ROANOKE, VA.

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STRUCTURAL STEEL
BUILDINGS AND BRIDGES
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Electric Arc Welded Parking Garage

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BETTER CONSTRUCTION AT LOWER COST



**THE
AETNA STEEL
CONSTRUCTION
COMPANY**

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Florida

GLAMORGAN
PIPE & FOUNDRY CO.
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STRUCTURAL for BUILDINGS and BRIDGES

Capacity 1000 Tons per Month. 3000 Tons in Stock

Carolina Steel and Iron Company

The Largest Steel Fabricators in the Carolinas

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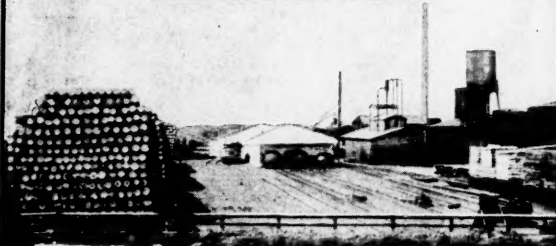
Piling, Poles, Lumber, Cross Arms,

Cross Ties

Also Wolmanized Lumber

Decay and Termite Proof—Can Be Painted

Docks for Ocean Vessels



American Creosote Works, Inc.
New Orleans, La.

Atlantic Creosoting Co., Inc.
Norfolk, Savannah, New York

Plants at: New Orleans; Winnfield, La.; Louisville, Miss.;
Savannah, Ga.; Jackson, Tenn., and Norfolk, Va.



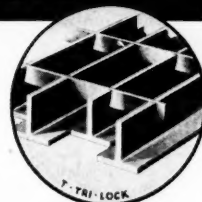
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TRI-LOK

**OPEN STEEL FLOORING • SAFETY STEPS
CONCRETE ARMORING T. TRI-LOK**

DRAVO CORPORATION
300 PENN AVENUE, PITTSBURGH, PA.
REPRESENTATIVES IN PRINCIPAL CITIES



Full descriptive catalog
of Tri-lok Grating, Safety
Treads and other prod-
ucts on request.



Contracts Wanted

(Continued from page 52)

Material: S.A.E. 1035 O. H. Bar Steel; Heat treat in Bar 35 to 38 scleroscope.

Ref. Buescher-19-2

A Government Agency requires 600 FUEL PUMP DRIVE GEARS for Diesel Engines. Delivery required: 90 days after date of contract. Dimensions: 4.634" O. D. x 1-13/32" width; Bore — .983" plus .001"; Face of Gear — 3/4". 57 teeth, 14 pitch, 25 degrees R. H. Helix cut teeth. Heat treat 38 to 43 scleroscope. Material: S.A.E. 3149 O. H. Forging Grade Steel.

Ref. Buescher-19-3

A Government Agency requires 400 CRANKSHAFT GEARS for Diesel Engines. Delivery required: 90 days after date of contract. Dimensions: 4.1595" — .003" O. D. x 1 1/2" width; Bore — 2.000" — .001". 27 teeth, 8 pitch cut teeth, 30 degrees, 30 minutes, 48 seconds L. H. Helix 14 1/2 degree pressure angle, involute tooth .001 eccentricity allowed on pitch diameter. Material: S.A.E. — 1035 open hearth steel, heat treated in bar to scleroscope hardness of 35 to 38.

Ref. Buescher-19-11

A Government Agency requires 450 GENERATOR DRIVE GEARS for Diesel Engines. Delivery 90 days after date of contract. Dimensions: 3-33/64" O. D. x 2 3/4" width gear face 1-7/32", 30 teeth, 10 pitch, 26 degrees, 50 minutes L. H. Helix. Material: S.A.E. 1120 O. H. Steel. Heat treat in bar scleroscope 35-38.

Ref. Buescher-19-10

A Government Agency requires 350 INTERNAL REDUCTION GEARS for Diesel Engines. Delivery 90 days after date of contract. Dimensions: O. D. 5/16", width 2 3/4"; gear face 1 1/4", ground bore 1.3225" plus .0005"; ground diameter 1.968" plus .0005"; internal gear—43 teeth, 10/12 pitch, 20 degree pressure angle, P. D. 4.300". Material: S.A.E. 6145 steel forging. Heat treat —Rockwell C47-53.

Ref. Buescher-19-8

A Government Agency requires 275 REDUCTION GEAR PINIONS for Diesel Engines. Delivery required: 90 days after date of contract. Dimensions: O. D. 4.0 inches, width, 3-11/16". Gear Face 1 1/4". 22 teeth, 6 pitch, 14 1/2 degree pressure angle. Tolerance: Face to be flat and square with Bore within .0005". P. D. concentric and parallel with Bore within .001". Material: S.A.E. 4820 O. H. Steel. Carburize and harden to Rockwell C-50-55.

Ref. Buescher-19-9

A Government Agency requires 275 EXTERNAL SHAFT GEAR ASSEMBLY for Diesel Engines. Delivery 90 days after date of contract. Dimensions: Overall length 11-51/64", gear face 1.339", gear diameter 2.260", 21 teeth, 10/12 pitch, 20 degree pressure angle. Shaft diameter, ground step 1.5747" plus .0004"; body ground 1.380" plus .001"; end ground .758" plus .001"; outline drilled full length. Material: S.A.E. 4820, carburize and harden scleroscope. 70-80.

South's Contracts Up

(Continued from page 42)

and with an aggregate of \$93,073,000. Third, fourth and fifth in the order named, are Maryland, \$54,779,000; Georgia, \$50,519,000, and Virginia, \$45,523,000. Oklahoma ran close to the latter with a \$44,664,000 total, while in seventh place was Tennessee with its \$36,554,000.

Other totals were: Arkansas, \$25,483,000; South Carolina, \$24,542,000; Alabama, \$22,523,000; North Carolina, \$22,156,000; Louisiana, \$21,974,000; Mississippi, \$20,463,000; Kentucky, \$17,624,000; Missouri, \$12,367,000; District of Columbia, \$8,129,000, and West Virginia, \$6,821,000.

Trade Literature

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Booklet—The units described are for large volumes of liquid at comparatively low heads. Available in complete range of sizes to 75,000 gpm and for heads to 100 feet per stage. Well suited as condenser circulating, mine and general sump drainage, dry-dock dewatering, process work, bulk liquid transfer, irrigation, flood control, refinery processes, etc. 20 page descriptive booklet in two colors with 27 illustrations. Specify Form 7073.

Ingersoll-Rand Company, 11 Broadway, New York, N. Y.

THE TREND TO WOMANPOWER

Report—No. 136 contains a digest of facts regarding employment of women in war industries. Covers many subjects such as the types of work in which women prove effective. Also, those least suitable for women; the training of women for industries, how to dress, health, nutrition, absenteeism, etc.

George S. May Business Foundation, 111 South Dearborn Street, Chicago, Ill.

CONSERVATION EVERYWHERE

Booklet—"Conserve for Victory." 12 pages profusely illustrated, Flashes No. 43. The near infrared process used for drying, dehydrating, preheating and similar operations are shown.

The Fosterite Pressed Steel Corporation, Fostoria, Ohio

200TH ANNIVERSARY

Booklet—From Mr. George R. Hanks, president Taylor-Wharton Iron & Steel Company, comes an attractively illustrated 60-page book of intense historical interest to the iron and steel industry. The book contains articles on the history of Allen and Turner, the Union Iron Works and the Taylor-Wharton Iron and Steel Company covering a period of 200 years. This is the country's oldest iron and steel producer.

Taylor-Wharton Iron & Steel Company, High Bridge, New Jersey.

South's Highest Authority

The following is taken from a letter addressed to the Members of the Florida Legislature by Gus Valdespino, Tampa.

"The MANUFACTURERS RECORD of Baltimore, Maryland, is recognized as the highest authority on the South.

"In a recent issue there are contained some paragraphs which are of
(Continued next column)

Lend-Lease Shipments

Lend-Lease Administrator Edward R. Stettinius, Jr., has reported on lend-lease shipments up to April 1. He gives figures of the dollar value and the increases in the twelve months beginning April 1, 1942, as compared with the year preceding as follows:

United Kingdom	\$886,233,000	\$2,230,602,000
Soviet Union	162,221,000	1,663,256,000
Africa and Middle East	169,746,000	870,017,000
China, India, Australia and New Zealand ...	138,532,000	753,193,000
All Other	55,373,000	175,558,000
Total	\$1,412,105,000	\$5,692,626,000

In the breakdown giving details of various items, very interesting facts are revealed. For example, \$600,000,000 worth of trucks and military motor vehicles have been sent into action against the enemy, principally on the Russian and Tunisian fronts.

In the year and a half prior to April 1, 1943, more than 3,500,000 gross long tons of supplies were shipped to the Soviet Union from the United States.

vital importance to the business in which you are now engaged, to wit: Legislating.

"I quote: 'Laws in a representative democracy are passed by its legislature. They are administered by the executive branch of the government. Executive decrees, even in wartime, and especially when issued to enforce something which it is doubtful the legislature will pass, smack of dictatorship. We are fighting for government by law'."

Commemorating An "E" Award

The Moore Steam Turbine Division of the Worthington Pump and Machinery Corporation, Wellsville, New York, has commemorated the presentation of the coveted Army-Navy "E" Award with a very attractive booklet in colors. Exceptional performance on the production front is the goal which has been attained and the "E" award by those directing the war effort is something to be treated in more than a routine way.

There is a message in the booklet from M. D. Church addressed to the men and women of the Moore Steam Turbine Division. He speaks of the gratification and pride that each one of these loyal workers must feel "in the splendid teamwork which has achieved the results and merited the award."

A salute is given to the 80 employees of the company who are now in the service.

Steel Plate Production at All-time High in April

The Office of War Information announced last month that steel plate production in April reached an all-time high as a result of increased rollings during the latter half of the month. Shipments totaled 1,121,647 tons. The same month of the year previous totaled 895,971 tons.

Shipments by continuous strip mills, converted to production of steel plate, amounted to 535,548 tons in April, compared with 337,519 tons in April of last year.

March 11, 1941 to April 1, 1942	April 1, 1942 to April 1, 1943
\$886,233,000	\$2,230,602,000
162,221,000	1,663,256,000
169,746,000	870,017,000
138,532,000	753,193,000
55,373,000	175,558,000
\$1,412,105,000	\$5,692,626,000

The gratifying announcement is made that in spite of losses "suffered principally on the North Russian route, the overwhelming majority of lend-lease supplies to Russia is arriving."

Almost 1,000,000 tons of food have been shipped to the Soviet Union, and 8,000 tons of seeds "to grow food in newly developed agricultural areas behind the Urals and far in the interior of Siberia" have been sent to the Russian people.

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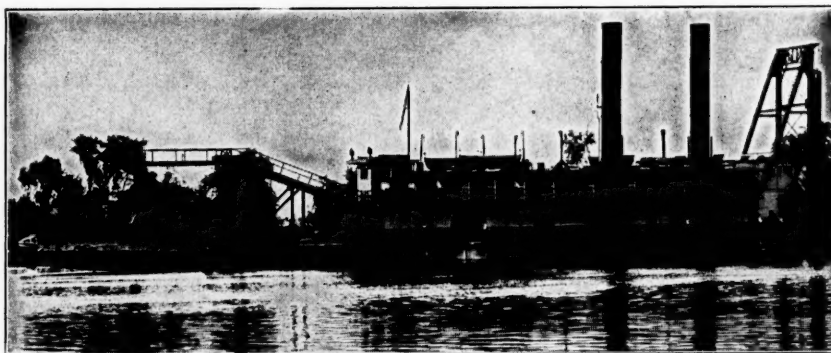
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Landing Isles Proposed

(Continued from page 37)

Anchored at 800-mile intervals on the surface of the Atlantic Ocean, the great steel vessels would stand 70 feet above the ocean with a substructure of huge buoyancy tanks extending 160 feet below the water. This deep draft, it is claimed in the announcement made by Pennsylvania-Central officials, would keep the floating airports "as steady as the mainland itself."

Each airdrome would provide complete airport facilities in addition to the important refueling operation. Hotel facilities are contemplated for passengers desiring to "vacation at sea." Length of the landing deck is to be 3,500 feet, according to present plans, with width varying from 400 feet at the middle to 250 feet at the ends. Lightweight of the big vessels is placed at 64,000 tons.

The Sun Shipbuilding and Drydock Co., one of the nation's larg-

est shipbuilders, will construct the seadromes as soon as steel is available. Associated with the Sun Company on the project, said the Airline announcement, are United States Steel Corp., the Wirth Steel Co., Belmont Iron Works and John A. Roebling Co.

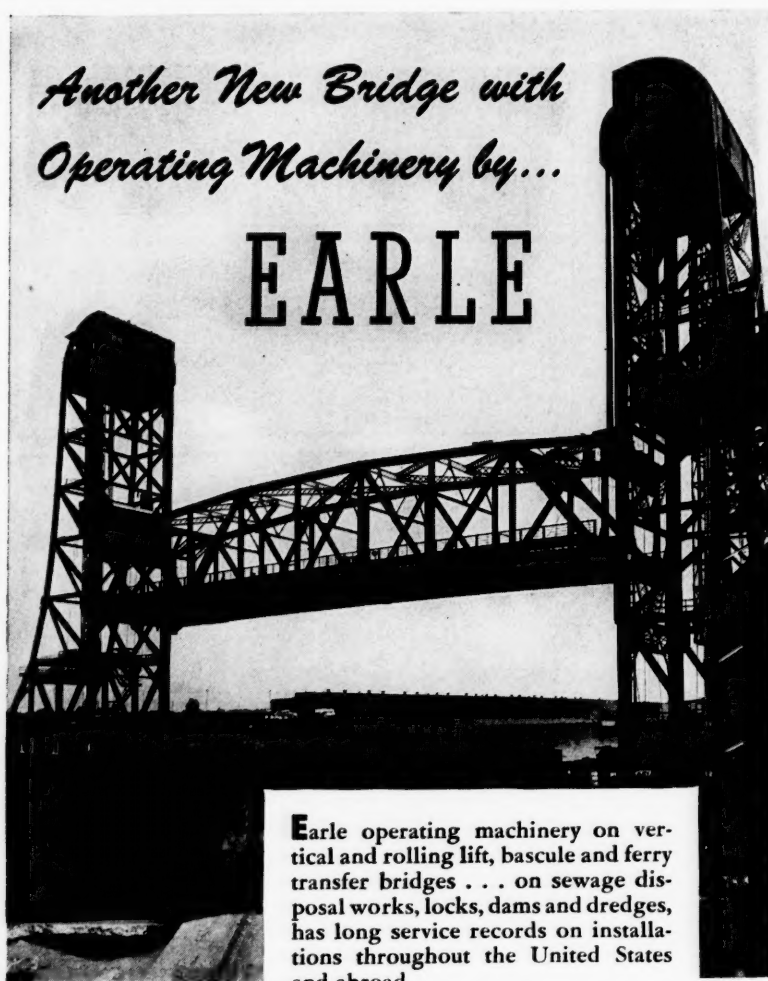
C. Bedell Monro, president of Pennsylvania - Central Airlines, says that the Air Transport Command in flying its planes to all parts of the world has demonstrated the ease with which ocean skies can be conquered and that the mystery which has been created in the public mind that this type of flying is difficult has been completely blasted.

Seadromes, which would be an adjunct to ocean flying operations, would have three decks under the flight deck. The first of these would provide accommodations for passengers and crew of the planes. On the second, height of which is placed at 28 feet, would be the hangar space for repair and inspection of the aircraft, with lifts connecting to the flight surface. The lowest level would house the machinery required for operation of the seadrome and for lighting, radio and other services.

The decks would be supported by vertical columns arranged in rows. Each column consists of an upper and lower member, the upper member being streamlined to reduce wind resistance and extending downward from the deck section to a point below the sea surface to a circular buoyancy tank. The lower member, for expediency in construction and towing to the anchorages, would telescope within the upper member.

Huge, heavy anchors would be sunk to the ocean bed and to these would be attached surface anchorages which in turn would serve to hold the floating airfields in position. Electrically or other power driven propellers would be installed to maneuver the vessels, as well as to assist in making the trip to the points designated on the ocean's surface.

Financial arrangements are to be accomplished through private capital. No estimates of the cost were announced, but the cost of similar but smaller projects proposed within the last decade was placed at \$5,000,000. S.A.L.



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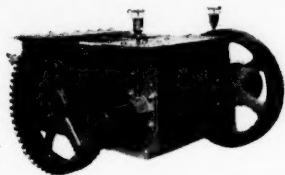
Earle operating machinery on vertical and rolling lift, bascule and ferry transfer bridges . . . on sewage disposal works, locks, dams and dredges, has long service records on installations throughout the United States and abroad.

Send for the Earle booklet 42-B. It illustrates and describes a number of Earle bridge operating machinery installations.

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45 sizes and types for *primary* and *secondary* reductions of limestones, cement rocks and a wide range of industrial and non-refractory products—coals, limes, gypsums, chemicals.

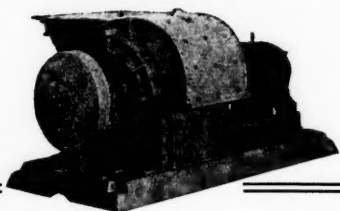
Ask for more information in Bulletin No. 2006 sent to interested parties.



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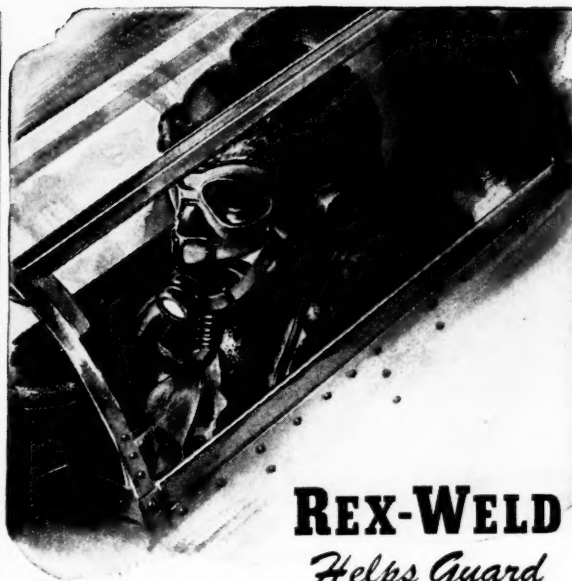


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Type RW-81
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General Offices: MAYWOOD, ILLINOIS

Factories: Maywood and Elgin, Illinois

Official Stresses Research as Business Aid

(Continued from page 46)

stimulating. The imagination of the entire textile industry has been stirred by the advent of these new materials, and the fact that millions of combinations of elements remain untried, acts as a challenge and a spur to research rather than a deterrent. There cannot but be a bit of the Jehovah complex in a research physical chemist when he creates a new material, and the satisfaction of creative accomplishment is the main pleasure to be derived from any work.

"With this heightened interest and activity, with the increasing complexity of the possibilities, and the diversity of products and characteristics of products which can be sought and might be developed, the careful planning of research becomes both a necessary and an increasingly difficult task. Out of it seems to emerge the place for a new type of research which might be called inter-research.

With research in chemistry, in plastics, in textiles, and with all the related products, such as dye-stuffs, detergents, finishes, coatings, each being the subject of research, there is a need for research correlation as well as executive correlation.

"By inter-research is meant the search for all the possible practical uses for an idea, an invention, a material, or a product. The discovery of a new plastic material might lead to the manufacture of new chemicals to go into it. The chemicals might be accompanied by by-products, which will be wasted unless uses can be found for them. The plastic might be found to have uses in some forms as a thermoplastic, in others as a thermo-setting material. It might be used as a material for molded and extruded objects of various kinds, and it might be found to have fiber forming characteristics as well. It might be useful also as a coating or finish for fabrics.

"Each department in a large

industrial corporation may properly have a research division working on the prospects and products for that department. Inter-research takes the result, product or problem and sees what can be done to fit it into the business of the other departments or to make a business of it that may be outside the corporation's, or for that matter, an entirely new business."

Fireless Locomotives

(Continued from page 36)

pressure in the reservoir drops and some of the hot water flashes into steam. This newly created steam draws its heat of vaporization from the hot water which remains in the liquid state; and, in turn, the temperature of the water is reduced. During charging, this process is reversed. The charging steam condenses and gives up part of its latent heat and its heat of liquid to the water, thereby raising the temperature of the water and also

(Continued on page 64)

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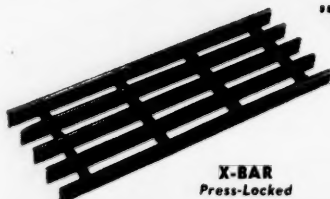
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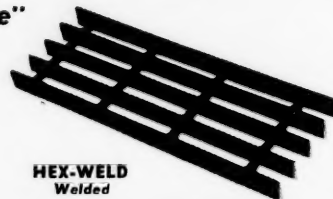
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The Wells and Pumps in Tunis—and those throughout the African War Zone—Dakar, Algiers, Casablanca, Sousse, Kairouan, etc., were installed by Layne Engineers for peacetime duty, but they had the guts that made them give outstanding war-time service.

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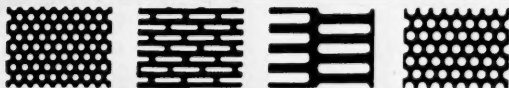
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Fireless Locomotives

(Continued from page 62)

replacing water previously drawn off into steam.

The geared fireless locomotive came as a later development as an adaptation of the direct connected. Similar in many respects, the geared engine, in the design of which the writer was privileged to take part, has numerous distin-

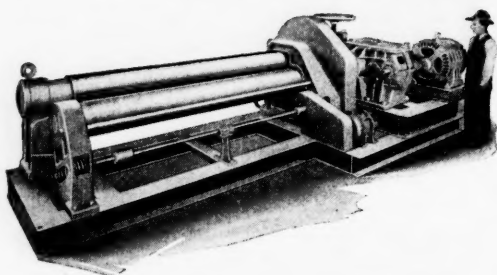
guishing features. It represented the first fireless with piston valves, and at the time the only locomotive with these valves below the cylinders. Such a design, combined with higher piston speed, perfectly insulated cylinders and steam pipes, as well as smaller surfaces and metal masses to conduct and radiate heat, produces a higher steam efficiency than the direct connected fireless. The geared engine has a steady driving torque, counteract-

ing any tendency to slip the wheels.

While limited in radius of operations, like any other machine operating on stored energy, compensating factors render the fireless locomotive of either type particularly applicable to many war operations. To its fireproofness should be added that it is explosion proof, since excessive pressures are not possible. It is a fuel saver. In stand-by service there is

(Continued on page 68)

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PYRAMID AND INITIAL TYPES Various Sizes and Capacities

Prompt Delivery on Standard Sizes
Special Machines Built on Order

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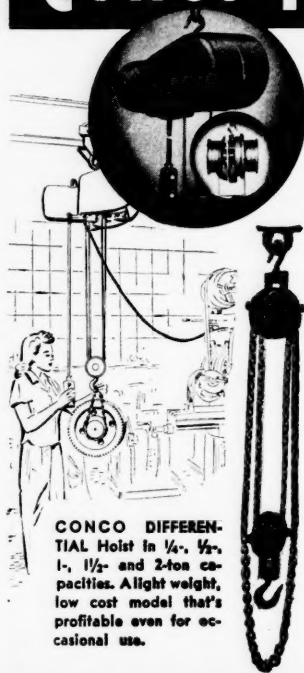
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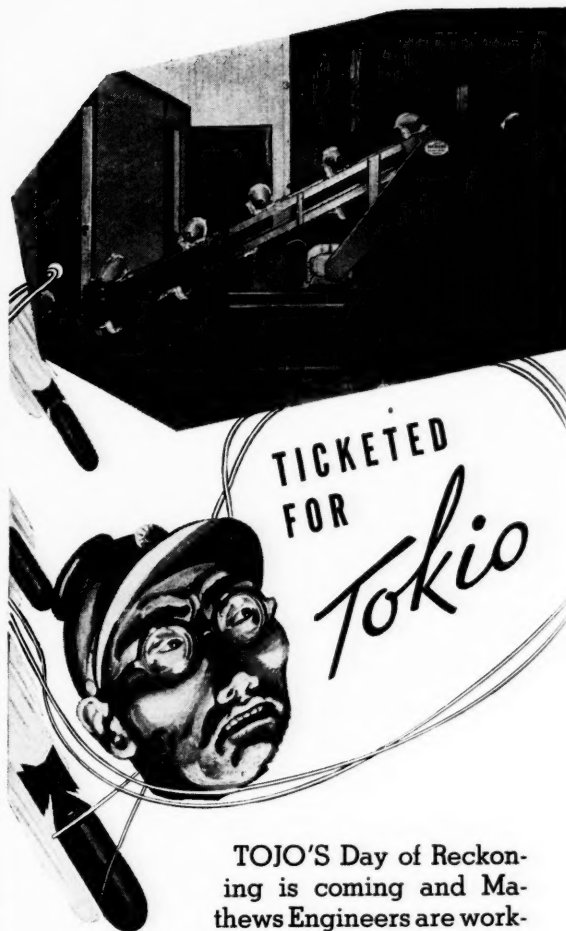
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ALLIGATOR

TRADE MARK REG. U.S. PAT. OFFICE

STEEL BELT LACING

For more than 30 years the most universally used steel belt lacing in the world.




TOJO'S Day of Reckoning is coming and Mathews Engineers are working with Plant Engineers to speed that day.

Night and day . . . month after month, Mathews Conveyers are moving an endless procession of bombs, shells, cartridge cases, and vital plane parts, many of them destined to make it warm in Tokio.

If your production depends on precision movement of materials and supplies, a Mathews Time-Coordinated Conveyor System is a sure means of speeding operations all along the line. A Mathews Engineer will gladly consult with you on your problem.

MATHEWS CONVEYERS FOR MECHANIZED PRODUCTION



If you are manufacturing war material, or anything vital to the success of the war effort, you can get Mathews Conveyers to handle that material. Rely as usual on your Mathews Engineer.

MATHEWS CONVEYER COMPANY

ELLWOOD CITY PENNSYLVANIA

Fireless Locomotives

(Continued from page 64)

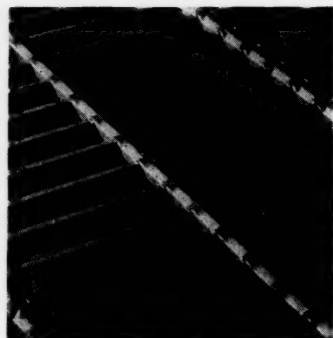
practically no fuel consumption.
Heavy insulation on the reservoir

keeps to a negligible point loss through radiation.

Few wearing parts and simple construction make the engine more economical of critical materials in

building, and thus reduce repairs, breakdowns and replacements. Principal parts include pistons and cylinders, wheels and axles, valve motion, brake rigging and shoes which are common to most other locomotive types. More impressive perhaps is the listing of absent parts; such as boiler and firebox, internal combustion engine, electric motors and generators, delicate controls, etc., mechanism where trouble might occur.

Although introduced at the start of the first World War in this country, fireless locomotives did not come into their own until the depression of the thirties, when all elements entering into cost of manufacture and maintenance were searchingly studied. Today, operating under a different sort of economy of scarcity produced by war, the fireless is saving critical materials, production delays, fuel, and providing maximum comfort in working conditions with a locomotive power free from smoke or noise. This unorthodox offshoot of the locomotive line has become a valuable mechanical war worker.



GARY WELDED GRATINGS

Square edge bars for safe footing.
Hexagonal cross bars for neat appearance.

Gary-Riveted Grating :: Gary Stair Treads

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Get Myers new Manual on the Care and Maintenance of Pumps and Water Systems. No matter what make of pumping equipment you own it tells you how to make minor adjustments and simple repairs. Points out preventive measures to avoid serious breakdowns which result in loss of valuable production time. It's Free for the asking.

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